

FEASIBILITY STUDY OF RURAL HAAT/PAINTHS-1999

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CHAPTER I

INTRODUCTION

I. BACKGROUND

One of the objectives of U.P. Diversified Agriculture Support Project (UPDASP) is to strengthen the rural marketing facilities by constructing additional infrastructure in the existing haats/painths of the project districts of the state. The past experience and evidence indicate that although the development of regulated agricultural markets has been impressive, market development in general has been spatially uneven and limited attention was focussed on the improvement of small rural periodic markets. For instance, the Eastern Region of U.P., characterized by the low marketable surplus, is still served largely by the periodic rural markets and to a lesser extent by the large market yards. Therefore, for stimulation and diversification of agriculture in the region, the development of rural haats/painths is essential. The commissioning of the Giri Institute of Development Studies, Lucknow by the UPDASP, to undertake the feasibility study of the rural markets of selected blocks of the Eastern Region of U.P., whose annual throughput level has either crossed the mark of 1000 MT annually or expected to touch this figure within next four to five years assumes immense significance. The twelve (12) rural markets of thirteen blocks of four districts namely Varanasi, Jaunpur, Kaushambi

and Allahabad of Eastern Uttar Pradesh have been identified for detailed feasibility study. The study focuses on :

1. Details of the produce brought in the market
2. Details of the infrastructural facilities existing and required
3. Details of the revenue generation in the market and the expected increase in the revenue through market fee, etc. after market improvement programme
4. Exploring the possibility whether the market can be made self-supporting.

Keeping in view the above broader points, the following objectives guided the feasibility study of the markets under consideration.

II. OBJECTIVES

1. To examine the existing throughput level of the identified markets.
2. To estimate the growth in throughput which may come after the market improvement.
3. To make an overall assessment of the uses of existing facilities in the market including who uses the facilities, for what purpose, how often the market is used and when? What facilities such as internal brick soling, road work,

surface/storm water drainage system, covered sheds, sales platforms, storage godowns, drinking water facilities, sanitary block, garbage collection, shed tree plantation, fencing, cycle stand, cattle sheds, lighting arrangement, etc. are existing and required.

4. To prepare the existing plan and proposed plan for the development of the markets.
5. To determine the hinterland of the rural markets and the position of all roads connecting the markets with the nearest town or mandi or main link roads.
6. To examine whether adequate finances could be generated from these markets after their improvement, to cover all operational/maintenance costs and if funds remain available for further market improvement.
7. To examine whether at any threshold level, identified rural markets could become as a regulated market yard and may be considered for improvement by the Mandi Parishad.
8. To investigate whether the improved markets can be used for other purposes during non-market days.

III. METHODOLOGY

The study is based on the primary as well as secondary data. Market survey was conducted on pre-structured questionnaire, designed for soliciting information about the markets and farmers/traders. The information to conduct this study is also based on Participatory Rural Appraisal Method (PRA). Meeting with the district, block and village level officers (including District Panchayati Raj Officers (DPROs) and District Horticulture Officers (DHOs)), block and village level elected representatives, observation of the market situation and the socio-economic profile were the methods used for collecting relevant information. The primary data has been collected from the sample of each rural haat painth relating to farmers and traders who generally bring their commodities for sale in the market. The sample of the study has been further categorized into male and female, farmers/traders bringing their produce for the sale in each of the identified rural markets. The efforts were made to provide proportionate representation to each constituents of the markets, viz. male female, farmers/traders and commodity groups in the study sample.

Besides, locational site plans and the existing and proposed plan for the improvement of identified markets were prepared by M/s. Innovations, Architect/

Civil Engineer associated with this study. The architect, surveys, civil engineering of this consultancy firm along with the research team of the Giri Institute of Development Studies, Lucknow visited different markets. The entire data were handled through computer using MS-Office-98. The analysis of the data relating to the economic analysis has been presented in the tabular form. The analysis of financial viability of the each markets was carried using the following methods:

- (i) Net Present Value (NPV)
- (ii) Equivalent Annual Cost (EAC)
- (iii) Internal Rate of Return (IRR)

As stated earlier the feasibility study of the rural market was to be conducted in 13 blocks of Varanasi, Jaunpur, Kaushambi and Allahabad districts of Uttar Pradesh. We visited all these blocks to identify rural markets for feasibility study, according to criteria laid down under Terms of Reference (ToR) of the proposed study by UPDASP. However, the rural markets could be identified only in 10 blocks of the total 13 listed blocks. The details of the selected rural haat/painths along with respective blocks and districts have been given as following:

Feasibility Study of Identified Rural Haat/Painths

Districts	Block	Market
1. Varanasi	1. Araji Lines 2. Baragaon 3. Sevapuri 4. Haraua 5. Chiraigaon	1. Sahansa 1. Baragaon 1. Badaura 1. Beera Patti No Market Found as per selection criteria.
2. Jaunpur	1. Khutahan 2. Dharmapur 3. Buxa 4. Shahganj	1. Khutahan 1. Gauspur 1. Sevainala 1. Gorabadshahpur 2. Teji Bazar 3. Sarain Mohiuddinpur
3. Kaushambi	1. Muratganj 2. Nevada 3. Chail	1. Patti Narvar No Market Found as per selection criteria No Market Found as per selection criteria
4. Allahabad	1. Phoolpur	1. Kapsa

**SAHANSA RURAL MARKET
BLOCK ARAJI LINES
DISTRICT VARANASI**

I. LOCATION OF THE SAHANSA MARKET

Sahansa rural market is the tri-weekly market held at Sanhansapur village on Monday, Wednesday and Saturday. The total distance of Sahansa rural market from Varanasi is about 31 kms. To reach this market, one has to travel about 18 kms. towards Raja talab block. From Raja talab 10 kms. again upto Jakhani. The rural market of Sanhansapur is about 3 kms. from Jakhani located on Jakhani-Adalpura road. This is an old and very popular rural market of the area. The market is being held at a community ground owned by Gram Panchayat basically meant for holding Ramleela and other social functions of the area. The revenue collected from the market by the members of the Ramleela Samiti. The revenue collected from the market is actually used for organizing Ramleela in the area. Thus, at its present location, any sort of improvement on provision of market infrastructural facilities is not possible. Moreover, some of the shops selling meat and fish are prohibited to enter in the market area, in such conditions they are forced to remain away from market place. The Gram Panchayat, therefore, has agreed to provide an alternative site by the side of the road near to the Sahansapur village. The detailed location of the existing market and alternative site is presented in the enclosed map. The hinterland of the Sahansa rural market consists of following 10 villages, which are likely to go up further with the availability of improved market infrastructural facilities in a bigger and separate market place.

Name of the Village	Distance from the Market (in kms.)
1. Dhanapur	1.00
2. Paniara	1.00
3. Narottampur	1.00
4. Jakhani	3.00
5. Sahansapur	0.50
6. Mangraha	3.00
7. Kusaha	2.00
8. Adalpura	2.00
9. Laskarva	1.00
10. Sursi	3.00

II. STRUCTURE OF THE MARKET

The team visits to the Sahansa market on market days and detail discussion was held with the Gram Pradhans of Sahansapur village, farmers, traders and other knowledgeable persons related to the village and rural market of Sahansapur informed about the structure of the market. The rural market of Sahansa consists of about 120 shops of farmers/traders in any market day. Only vegetables and Gur shops are found present in any market day in this rural market. Among the total shops of these two agricultural produce, the vegetable shops are found to be maximum (108), followed by gur shops (12) in Sahansa market.

The shops owned by the females are 16.66 per cent in total and 18.52 per cent of vegetables. None of the Gur shops is owned by any of the female farmers/traders. The commodity-wise total number of shops of male and females with their percentage share

is shown in Table-1. The sample selected for the study constitutes around 35 per cent as shown in Table 1.1.

Table-1 : Structure of the Sahansa Market

COMMODITIES	TOTAL SHOPS			PERCENTAGE OF TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	88 (81.48)	20 (18.52)	108 (100.0)	88.00	100.00	90.00
Gur	12 (100.0)	--	12 (100.0)	12.00	--	10.00
Total	100(83.33)	20(16.66)	120(100.00)	100.00	100.00	100.0

Note : Figures in brackets indicate percentage.

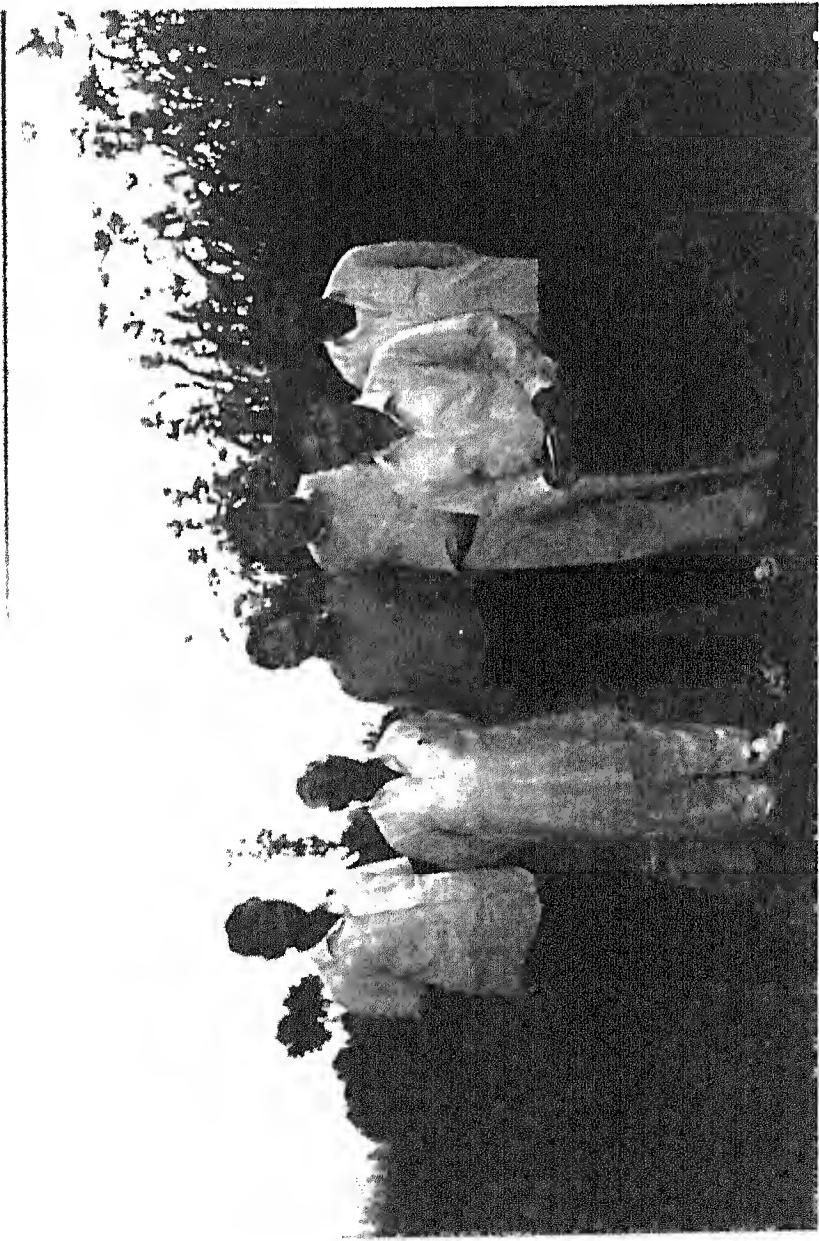
Source: Based on field data.

Table-1.1 : Sample of the Market

COMMODITIES	SELECTED SAMPLE SHOPS			PERCENTAGE OF SAMPLE SHOPS IN TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	32(86.49)	5(13.51)	37 (100.00)	36.36	25.00	34.26
Gur	5 (100.00)	--	5 (100.00)	41.67	--	41.67
Total	37(88.10)	5(11.90)	42 (100.00)	37.00	25.00	35.00

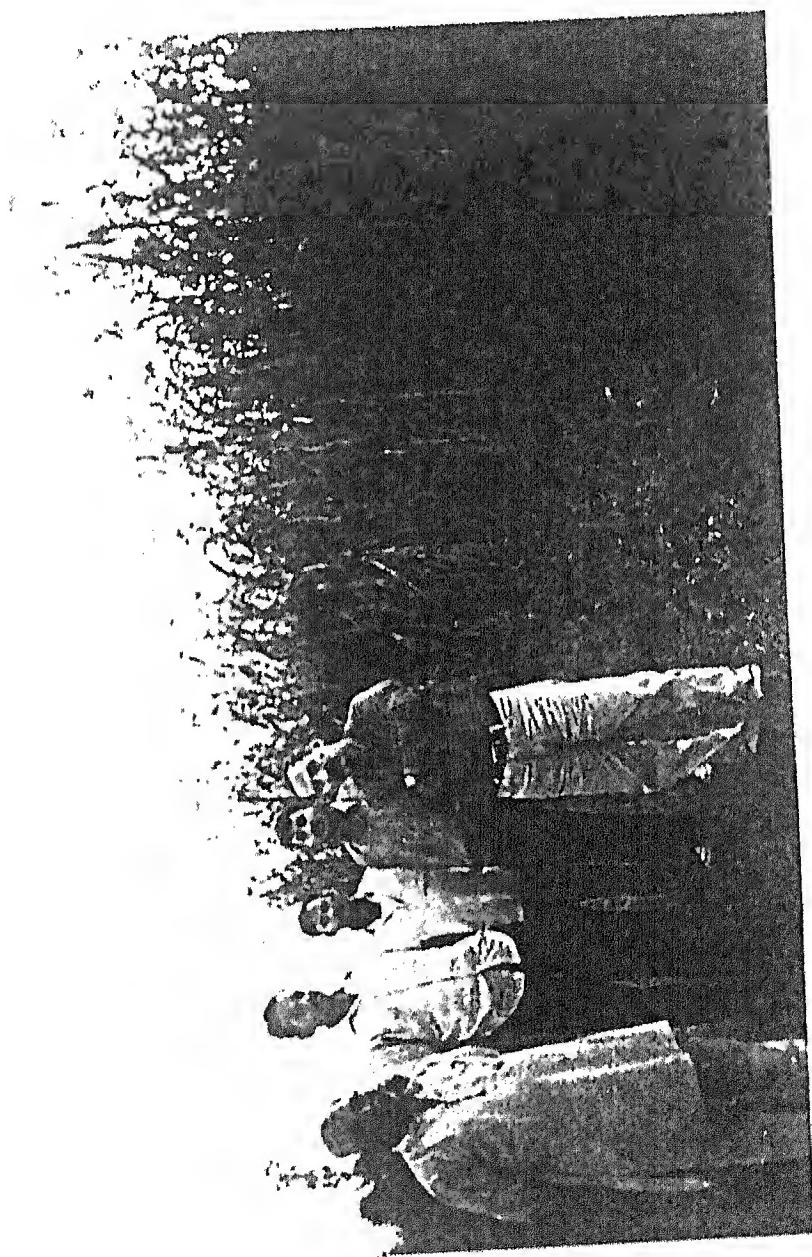
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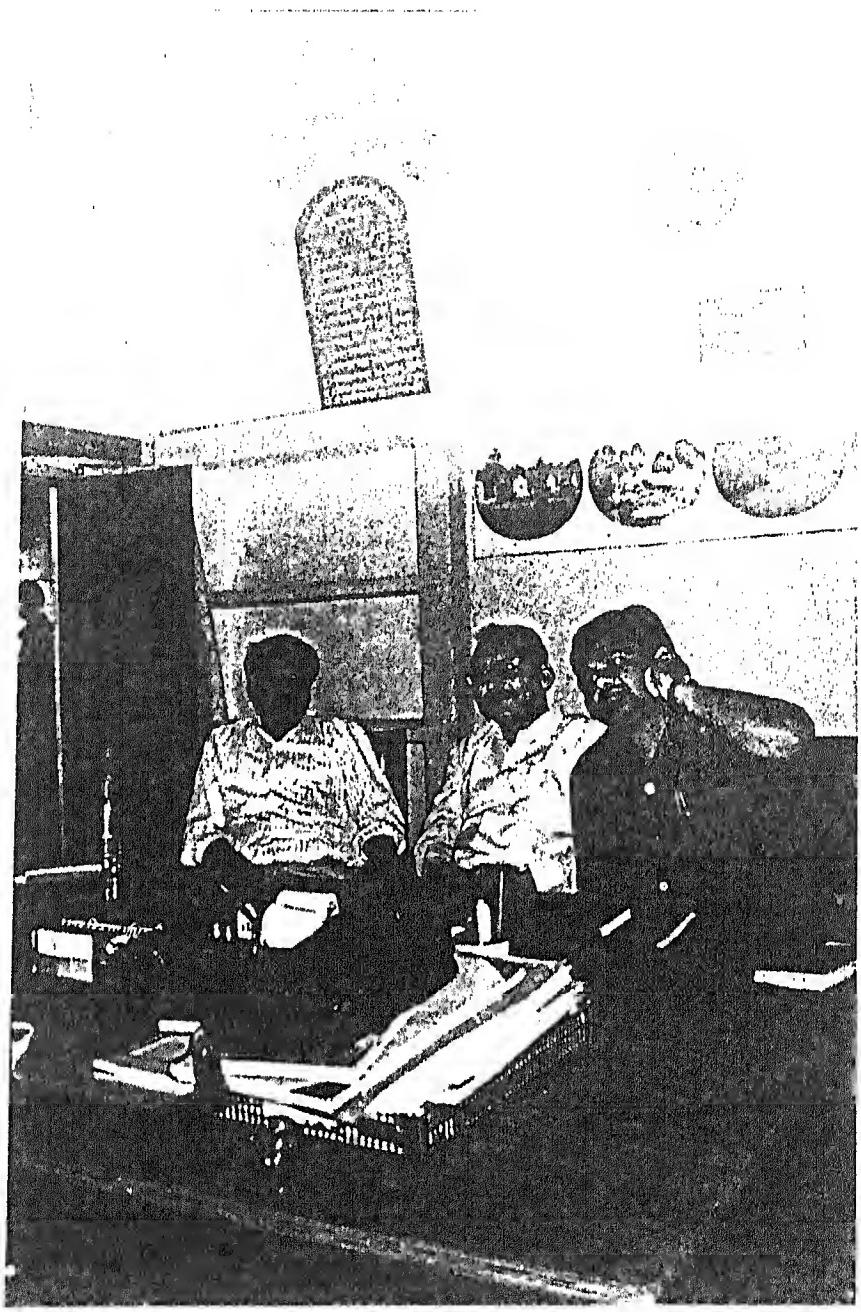
Source: Based on field data.



Members of Study Team Along with Village People
and others at new Market site at Sahangpur
Village of Vaynati

Members of Study Team Along With Village Bradhan
and other villagers at Sahansa March of
Varanasi -





Members of Study Team
with DPC Varanasi

III. COMPOSITION OF THE MARKET

The farmers and traders bring vegetables and gur for sale in rural market of Sahansa as shown in Table-2. In any of the three market days in a week, i.e. on Monday, Wednesday or Saturday, among all the sellers of both the agricultural produce categories, it is estimated that more than half of them are the farmers and less than half are the traders. In case of vegetable shops, more than 74 per cent are of farmers and rest nearly 26 per cent belong to traders. Contrary to this most of the Gur shops (83.33 per cent) are owned by traders and remaining (16.67 per cent) are run by farmers in Sahansa market. However, taking into consideration, total number of sample shops consisting of both types of agricultural produce shops, i.e. vegetables and Gur, around 68 per cent shops are run by farmers and remaining about 32 per cent found belonging to traders in the rural market of Sahansa. Thus, in case of agricultural commodities like vegetables, largely the farmers are involved in the selling which indicate the fact that the Sahansa rural market has three distinct features:

1. The Sahansa market is local agricultural based tri-weekly rural market;
2. It is primarily a market of vegetables, main vegetable of this area being green chillies;
3. It is primarily a market of local farmers.

Table-2: Farmers and Traders Composition in the Sahansa Market

Commodities	Farmers	Traders	Total
Vegetables	80(74.07)	28(25.93)	108(100.00)
Gur	02(16.67)	10(83.33)	12(100.00)
Total	82 (68.33)	38 (31.67)	120 (100.00)

Source : Based on field data.

IV. COMPOSITION OF THE SAMPLE

Taking into consideration total number of farmers and traders engaged in selling of both types of agricultural produce, the sample of Sahansa rural market contains 71.43 per cent farmers and remaining 28.57 per cent traders. In case of vegetables sample includes 78.38 per cent farmers and only 21.62 per cent traders. Contrary to this, in the sample of Gur shops share of farmers remained only 20 per cent and traders 80 per cent. The Table-3 shows the composition of farmers and traders in the sample of the study.

Table-3: Farmers and Traders Composition in the Sample of Sahansa Market

Commodities	Farmers	Traders	Total
Vegetables	29 (78.38)	8 (21.62)	37 (100.00)
Gur	01 (20.00)	4 (80.00)	5 (100.00)
Total	30 (71.43)	12 (28.57)	42 (100.00)

Source : Based on field data

V. TURN OVER OF AGRICULTURAL PRODUCE IN SAHANSA MARKET

The Sahansa market is the market of only agricultural produce which became evident that out of the total 120 shops each is found to be involved in the sale of only

agricultural produce. The vegetable commanded major share followed by Gur. The data collected from the sample shops shows that on an average 61 kgs. of vegetables are sold by each vegetable shops and 17 kgs. of gur per shop. On this basis, the total quantity of vegetable and gur sold by all shops in the market comes to 6556 kgs and 204 kgs. respectively as would be evident from Table-4.

Table-4: Actual Turn Over of Agricultural Produce in Sahansa Market

Commodities	No. of Shops in the Sample	Total Qty. Sold per Market Day by Sample Shops (Kg.)	Average Qty. sold per sample shop per market day (Kg.)	No. of Total shops in the market	Total Qty. sold by all shops per market day (Kg.)
Vegetables	37	2246	60.70	108	6555.60
Gur	05	85	17.00	12	204.00
All Agricultural Produce	42	2331	55.50	120	6660.00

Source : Based on field data.

One of the criterions of selection of rural haat/painths for the feasibility study is that the selected market should have turn over of more than 1000 MT per annum of all agricultural commodities. This pre-condition of market selection is justified in case of Sahansa rural market because estimates of the study have shown in Table-5 based on primary data collected from sample farmers/traders selling their commodities in this market indicated that this market has annual turnover of around 1139 MT including both types of agricultural produces. The annual turn over of vegetables has been estimated to be 1023 MT and 32 MT of Gur.

Table-5 : Annual Turn Over of All Agricultural Produce in the Sahansa Market

Commodities	Turn Over (MT)
Vegetables	1022.67
Gur	31.82
All Agricultural Produce	1038.96

Source : Based on field data.

VI. PERSONS INVOLVED IN BUYING AND SELLING

As per survey figures, there are 120 shops of different commodities in each market day of Sahansa rural market. In all the shops, more than one person remain involved in selling. The average number of persons per shop found to be involved in selling turns out to be 1.29 in case of agricultural commodities, while in sale of another item brought in the market for sale, i.e. Gur, average involvement is found to be one person as evident from Table-6. It is shown in table that on an average 23 persons make purchases from each shop of the market in one market day. In case of vegetables and gur, 24 persons and 11 persons per shop found engaged in purchases respectively. Thus, in case of Gur, lesser number of persons made purchases from each shop. In total 2744 persons are estimated to be involved in buying of different commodities per market day and roughly a total of 150 persons remain involved in the sale and purchase of different commodities per market day in Sahansa market.

Table-6: Total and Average Number of Persons Involved in Selling and Buying Per Market Day in Sahansa Market

Commodities	No. of Persons Involved in Selling	Average No. of Persons Involved in Selling	Total No. of Persons Involved in Buying	Average No. of Persons Involved in Buying (No.)
Vegetables	139	1.29	2607	24
Gur	12	1.00	137	11
Total	151	1.26	2744	23

Source : Based on field data.

VII. MARKET FEES, REVENUE OBTAINED AND ITS POTENTIAL OF THE MARKET

The information regarding market fee collection from Sahansa rural market revealed that farmers/traders of Sahansa market pay Rs.2/- per shop per market day as market fee to panchayat samiti. On the basis of rate of market fee of Rs.2.00 per shop per market day, a sum of Rs.37440.00 per annum is collected by Gram Panchayat of Sahansapur market (Table-7).

Despite collection of such an amount as market fee from the shop keepers of the rural market, the amount is not being utilized for the market, it is given at the disposal of Ramleela Samiti. In case of shifting of the market at proposed site, money collected as market fee can be used for the improvement of marketing infrastructural facilities by the gram panchayat.

Table-7 : Present Rate of Market Fee, Revenue Obtained from Market Fees and Present Potential Revenue per Annum of Sahansa Market

Commodities	Rate of Market Fee at Present	Revenue Obtained from Market Fee Per Annum at Present by Sample Shops		Revenue from Market Fee Per Annum at Present by Total Shops	
		Sample Shops		Total Shops	
Vegetables	2.00	37	11544	108	33696
Gur	2.00	05	1560	12	3744
Total	2.00	42	13104	120	37440

Source : Based on field data.

VIII. MODE OF TRANSPORT USED

The farmers/traders transporting the vegetables and gur for sale in Sahansa market are two types of transport modes, i.e. rickshaw/trolley and cycle. Some of the farmers/traders bring their produce in basket coming on foot from nearby villages located in market hinterland.

Since each farmer/trader brings small quantity, therefore, cycle has reported to be used by as high as 64 per cent of all farmers/traders bringing agricultural produce in the market. In case of farmers/traders of vegetables about 60 per cent of them found using cycle as mode of transport. Rickshaw/trolley is another important means of transport used by around 32 per cent of total farmers/traders in the rural market of Sahansa. About 8 per cent of total shop keepers of the market bring vegetable on foot using

baskets. However, for bringing gur in the market for sale, only cycle is used as mode of transport by almost all the farmers/traders of the market (Table-8).

Table-8: Traders Using Different Mode of Transport to Bring Agricultural Commodities

(No.)

Commodities	Rickshaw/ Trolleys	Cycle	Basket/ On Foot	Total
Vegetables	12 (32.43)	22 (59.46)	3 (8.11)	37 (100.00)
Gur	--	5 (100.00)	--	5 (100.00)
Total	12 (28.57)	27 (64.29)	3 (7.14)	42 (100.00)

Note : Figures given in brackets are percentage.

Source : Based on field data.

IX. DISTANCE COVERED TO REACH THE MARKET

According to market informations relating to Sahansa rural market, it is an important tri-weekly market of this area and its hinterland covers about 10 villages. The hinterland of market area being vegetable growing belt, more than 42 per cent farmers/traders bring their produce for the sale in this market covering less than 1 kilometre. About 29 per cent farmers/traders of this market bring their produce covering 2 to 3 kms. Remaining 26 per cent farmers/traders selling their produce are found to be located only 1 to 2 kms. away from the Sahansa rural market.

In case of vegetables out of total farmers/traders in the market about 49 per cent cover only upto 1 km. to reach this market. Remaining 51 per cent cover 1 to 3 kms. to bring their vegetable in this market for sale. Out of the farmers/traders engaged in the sale of Gur mostly (80 per cent) cover 1 to 3 kms. to reach the Sahansa market. Rest of them (20 per cent) come from less than 1 km. to the market place. Thus, on an average, farmers/traders travel less than 2 kms. to reach this market to sell their produce. All these characteristics indicate that the Sahansa market is an important market centre in terms of vegetable and gur for the people residing in sizeable large area. This market may prove to be an important vegetable (particularly green chillies) collection centre. Hence, its improvement may prove to be beneficial for large number of villages. Table-9 presents the classified details of distance covered by the farmers/traders of vegetable and gur to reach Sahansa market.

Table-9 : Classification of Sample Farmers/Traders According to the Distance Covered to reach the Sahansa Market

Commodities	Distance Covered Area				(No.)
	0-1 (km.)	1-2 (kms.)	2-3 (kms.)	Total	
Vegetables	18 (48.65)	9 (24.32)	10(27.03)	37(100.00)	1.55
Gur	1 (20.00)	2 (40.00)	2 (40.00)	5 (100.00)	2.00
Total	19 (42.24)	11(26.19)	12 (28.57)	42 (100.00)	1.61

Note : Figures in brackets indicate percentage.

Source: Based on field data.

X. EXISTING FACILITIES IN THE MARKET

As stated earlier, it is revealed from market visit, Sahansa market is held on a ground owned by Gram Panchayat basically meant for organizing Ramleela function in the village of Sahansapur. There is no specific and separate place for the market. Moreover, some traders/traders selling meat or fish are restricted to enter the market compound along with other farmers/traders because of the market place being basically for holding socio-religious function. The vital market infrastructural facilities are not available in the existing market place except drinking water facility. There is no electricity, shed, toilet, cycle stand, proper drainage, etc.

XI. NEED OF IMPROVED FACILITIES

On the basis of above observation regarding Sahansa market it may be concluded that Sahansa rural market lacks most of the required specific infrastructural facilities. To keep the market floreshing these facilities are required to be created as expressed by all the sample farmers and traders who are desirous of such facilities as evident from Table-10. It becomes obvious that farmers/traders selling different commodities in the market need improved facilities and all of them are agreed to pay higher market fee for using improved market infrastructural facilities.

Table-10 : Need of Improved Marketing Facilities in Sahansa Market

Commodities	Total No. of Farmers Shop	No. of Farmers Shops requiring improved facilities	No. of farmers willing to pay higher market fee	Total No. of Traders shop	No. of traders shop requiring improved facilities	No. of traders willing to pay higher market fee
Vegetables	29	29 (100.00)	8 (100.00)	8	8 (100.00)	8 (100.00)
Fruits	1	1(100.00)	1(100.00)	4	4 (100.00)	4 (100.00)
Total	30	30	30	12	12	12

Note : Figures in brackets indicate percentage.

Source : Based on field data

XII. TYPE OF MARKETING FACILITIES REQUIRED

As most of the infrastructural facilities are not available in Sahansa rural market to the farmers/traders bringing different agricultural produce for the sale in this market. The type of infrastructural facilities required by them in the market has been asked through PRA method by the members of research team in course of market survey. The replies of sample farmers/traders including male and female are presented in Table-11. Table shows that infrastructural facilities like drinking water, electricity, cycle stand, road and shed are required by most of the farmers/traders of this market. Besides these, open market place, platform, storage, permanent shops, toilet and proper drainage are some other facilities required by 25 per cent to 57 per cent farmers/traders of the market.

Among female farmers/traders coming in the market, the most preferred facilities are found to be toilet, drinking water, electricity and provision of permanent shops. The provision of other than these facilities in the market is also found to be in demand by the female farmers/traders as in case of male farmers/traders.

Table-11 : Type of Marketing Infrastructural Facilities Required by the Farmers/Traders of Sahansa Market

Commodities	Total No. of Farmers/traders	Place	Dri-king Water	Shed	Road	Plat-form	Elec-tri-city	Stor-age	Toilet	Pem-erant shop	Cycle stand	Proper drain-age
Vegetables	37	19 (51.35)	37 (100.0)	25 (67.57)	34 (91.89)	23 (62.16)	37 (100.0)	9 (24.32)	21 (58.76)	15 (40.54)	28 (75.68)	21 (56.76)
Male	32	16 (60.00)	32 (100.0)	21 (85.35)	32 (100.0)	20 (62.50)	32 (100.0)	8 (25.00)	16 (50.00)	11 (34.38)	28 (87.50)	19 (59.38)
Female	5	3 (60.00)	5 (100.0)	4 (80.00)	2 (40.00)	3 (60.00)	5 (100.0)	1 (24.32)	5 (100.0)	4 (80.00)	- -	2 (40.00)
Gur	5	5 (100.0)	5 (100.0)	3 (60.00)	2 (40.00)	4 (80.00)	5 (100.0)	2 (40.00)	3 (60.00)	3 (60.00)	5 (100.0)	6 (60.00)
Male	5	5 (100.0)	5 (100.0)	3 (60.00)	2 (40.00)	4 (80.00)	5 (100.0)	2 (40.00)	3 (60.00)	3 (60.00)	5 (100.0)	6 (60.00)
Female	-	-	-	-	-	-	--	--	--	--	--	--
Total	42	24 (57.14)	42 (100.0)	28 (88.87)	38 (85.71)	27 (24.29)	42 (100.0)	11 (28.18)	24 (57.14)	18 (42.86)	33 (78.57)	24 (57.14)
Male	37	21 (68.76)	37 (100.0)	24 (84.88)	34 (91.89)	24 (64.86)	37 (100.0)	10 (27.03)	19 (51.36)	14 (37.84)	33 (89.19)	22 (59.46)
Female	5	3 (60.00)	5 (100.0)	4 (80.00)	2 (40.00)	3 (60.00)	5 (100.0)	1 (20.00)	6 (100.0)	4 (80.00)	- -	2 (40.00)

Note : Figures in brackets indicate percentage.

Source : Based on field data.

XIII. EXPECTED INCREASE IN ARRIVALS AFTER MARKET IMPROVEMENT

Foregoing analysis pertaining to availability and requirement of infrastructural facilities in Sahansa market reveal that (i) market infrastructural facilities are mostly absent in the Sahansa market, and (ii) the farmers/traders of the market want improved facilities by paying higher market fee. An assessment about the increase in the quantum of turnover of agricultural commodities resulting from improvement in infrastructural

facilities has been attempted in case of Sahansa market. The analysis is presented in Table-12.

Analysis of data indicate that arrivals of vegetables in the Sahansa market are likely to increase by about 165 per cent and the arrival of Gur may increase to the level of 175 per cent per market day if improved market infrastructural facilities are made available therein. The average total arrivals in this process may increase more than 165 per cent. The overall expected increase in market arrivals may be attained, firstly through the increased quantum of market turnover in existing shops and secondly due to new entry of shops in the market. As per our assessment, around 80 new shops may enter in this market with the availability of additional and improved infrastructural facilities.

Table-12: Expected Increase in Arrivals of Agricultural Produce After Market Improvement in the Sahansa Market

Commodities	Vegetables	Gur	All Agricultural Produce
Number of Sample Shops	37	5	42
Total Qty. expected to be sold by sample shops per market day	3576	140	3716
Average Qty. expected to be sold by sample shops per market day (kg.)	96.65	28.00	88.48
Total No. of Shops in the market	108	12	120
Total Qty. Expected to be sold per market day in existing shops (kg.)	10438.20	336.00	10617.60
Expected increase in number of new Shops	72	8	80
Expected turnover of new entrants	6958.80	224.00	7078.40
Total expected increase in turnover per market day (kg.)	17397.00	560.00	17696.00
Actual Qty. sold per market day (kg.)	6555.60	204.00	6660.00
Percentage Increase	165.38	174.51	165.71

Source : Based on field data.

XIV. EVALUATION OF ECONOMIC BENEFITS EMANATING FROM MARKET IMPROVEMENTS IN THE SAHANSA MARKET

Along with bringing fresh agricultural produce from farm level to final consumers or to collection centre, there are other economic benefits which are likely to accrue in the process of market improvements. In fact these benefits should be considered as an important factor to take up the task of rural market improvement programmes. There are many economic benefits emanating from improved rural market infrastructure. These may broadly be classified in following categories:

1. As a result of increased volume of trade owing to market improvements, the percentage increase in per unit cost of sale turns out to be far lower than percentage increase in market fee collection;
 2. Improved efficiency of market operations in the form of better product display, better facilities and availability of more marketing hours for the buyers and sellers resulting in higher per unit price of agricultural produce. Hence, providing remunerative prices to the farmers/traders;
 3. Reduction in spoilage of perishable crops, vegetables and fruits with the availability of improved rural marketing infrastructure.
- I. Since it is very logical to propose before farmers/traders having shops in the market for bearing higher market fee for availing better market infrastructure. The shop owners in the rural market of Sahansa have convincingly agreed to pay higher market fee to bear the cost of capital (Rs.9,00,000/-) for improved market infrastructural facilities. With the availability of improved infrastructural facilities some (80) new shops are expected to join the market and all of them will be paying enhanced market fee in Sahansa rural market.

Table 13 presents the detailed picture of required increased market fee collection for different market produce owing to expected market improvements. At present market fee collection from all shops per market day turns out to be Rs.240.00 in Sahansa market. As per our estimate around 80 new shops will be joining existing 120 shops due to improvement in market infrastructure. In this way, a total of 200 shops will exist here after market improvement. In order to recover the cost of capital for market improvement and infrastructural investment a sum of Rs.868.00 per market day will be required to be generated in this market. This much amount may be generated by collecting around Rs.4.50 per market day from each of the 200 shops as market fee. If we consider the hike in market fee per market day on an annual basis, the required increase in total revenue, i.e. Rs.868.00 can be multiplied by 156 days of a year on which market will be held, it comes around Rs.135408.00. Thus, the required annual increased market fee to meet the cost of capital for market improvement will be attained with this much hike in market fee collection from Sahansa market. Each of the existing farmer/trader is found to be convincingly agreeing with this proposal and market fee hike.

Table-13 : Actual Market Fee Paid and Increased Market Fee Expected to be paid by Sample Traders/Farmers of Sahansa Market

Commodity	Total No.of Shops at present	Present Potential of Market Fee (Per Market Day)	Expected Total No. of New Shops After Market Improvement	Total Increased Market Fee Required for Market Improvements (Per Market Day)
Vegetables	108	216	180	781.2
Gur	12	24	20	86.8
Total	120	240	200	868.0

Source : Based on field data

Despite hike in total market fee collection to the tune 117 per cent per unit cost of improved marketing facilities in case of both types of agricultural produces sold in the market remains only marginally higher as shown in Table-14.

Increased market fee would result in an overall 117 per cent increase in market fee collection. As compared to this, estimates have shown that increase in per unit cost of marketing is likely to remain 25 per cent to 33 per cent in case of both type of agricultural produces brought in the market for sale. Thus, provision of improved marketing facilities without significant increase in per unit cost of marketing in Sahansa market is a considerable economic benefit.

Table-14 : Change in Marketing Cost Before and After Market Improvement

Commodities	Present Market Turn Over of Sample Shops (Per Market Day) (Kg.)	Total Market Fee Collected Presently from Sample Shops (Per Market Day) (Rs.)	Expected Market Turn-over after market improvement in sample shops (Kg.)	Total Expected Collection as Market Fee from Sample Shops (Rs.)	Percentage Increase in Fee Collection after Market Improvement (Rs.)	% Increase in Per Unit Marketing Cost (Rs.)
Vegetables	2246	74(0.03)	3576	160.58(0.04)	117	33.33
Gur	85	10 (0.12)	140	21.70 (0.16)	117	33.33
Total	2331	84(0.04)	3718	182.28 (0.05)	117	25.00

Note : Figures in brackets show per unit of marketing.

Source : Based on field data

II. As a result of improved marketing facilities and infrastructure in the tri-weekly market of Sahansa farmers/traders are expected to maintain the quality of their produce to be sold in the market. In other words, they will be able to bring their produce in the market in a more presentable manner. Buyers will also feel more comfortable and confident while purchasing the produce under improved marketing conditions. In such conditions farmers/traders selling their produce will very easily be able to justify at least 5 per cent increase in the prices of their produce. As there will be no real increase or very nominal increase in per unit marketing cost, this hike in price would be a net gain to the farmers/traders selling their produce in the rural market of Sahansa.

Table 15 gives an example of net gain from 5 per cent hike in average prices of vegetable and gur on account of improved market efficiency in the rural market of Sahansa. These estimates are based on quantity and prices of vegetables and gur recorded from sample shop owners in Sahansa market. However, the estimates are approximate because the factor of seasonality has been ignored. It is evident from these figures that under this process the highest gainers are vegetable sellers followed by traders selling gur. Data presented in Table-15 shows that farmers/traders involved in the trading manage to gain a sum of Rs.378552.723 per annum with the introduction of market improvement in Sahansa market.

Table-15 : Estimation of Net Gain in Marketing Under Market Improvement

Commodities	Estimated Total Value of Commodities sold per market at present (Rs.)	Estimated value of commodities to be sold per market day after market improvements (at current prices) (Rs.)	Estimated Value of Commodities to be sold after market improvements 5% high prices (Rs.)	Net gain per market day (Rs.)	Net gain per annum (Approx.) (Rs.)
Vegetables	16389	43492.50	45667.12	2174.62	339240.72
Gur	1836	5040.00	5292.00	252.00	39312.00
Total	18225	48532.50	50959.12	2426.62	378552.72

Source : Based on field data.

Other indirect economic benefits are also involved in the process of efficient marketing system. A transparent and efficient system, as suggested for Sahansa market, will reduce the interference of middlemen and brokers in the determination of agriculture and other produce prices in the market. This will result in direct benefit to farmers/traders on account of increased prices. This gain may lead to expansion of agricultural activities resulting in higher production in the catchment area of Sahansa market.

III. Erection of marketing infrastructural facilities in Sahansa market may provide special benefit in the trading of perishable produce like vegetables, fruits, gur and meat.

In case of vegetables, fruits and meats, availability of facilities like water shed, light and storage may reduce at least 20 per cent spoilage of arrivals in the Sahansa market.

The proportion of vegetables in total market turn over in Sahansa market is expected to go higher with the availability of above listed infrastructural facilities.

With the availability of water shed and storage the spoilage rate under such conditions may go down to less than 20 per cent. In case of meat and fish marketing (which is presently prohibited inside market premise), the availability of better infrastructural facilities will reduce the spoilage of these produce to a considerable extent. Apart from this the hygienic conditions will also be maintained with the availability of these facilities in the market. Under the ordinary conditions the spoilage of fruits and meat products is 25 to 35 per cent and it could be reduced to 15 to 10 per cent with the availability of required infrastructural facilities in Sahansa market of Araji Nines block.

XVI. FINANCIAL AND ECONOMIC APPRAISAL OF INVESTMENT IN RURAL MARKET OF SAHANSA

Introduction

Rural markets are a hub-centre of socio-economic activities in a region. Along with public services such as Primary Health Centre, Veterinary Hospital, Post Office, Bank, Educational Institutions, Play Ground, PCO, Police Station, etc., they provide a fillip to the tempo of social, cultural and economic growth of the region comprising of a

number of villages from where buyers and sellers of goods and services are attracted to these markets.

Existing conditions in some such markets are far from satisfactory. A typical market may consist of some stalls of a temporary nature and sellers sit on ground and on chabutras of houses and shops, open to sky without any shed or cover. Quite often they are held once, twice or thrice a week during the afternoon hours. Some may be the daily markets.

The products traded in such markets include vegetables, fruits, edible oil, spices, jaggery, festival goods and services, foodgrains, meat, fish, ready made wears, chappals, sweets, chhats, general goods and services of cobblers, smiths, barbers, etc. Arrival of commodities in the market fluctuates, depending upon the season and other factors.

Catchment area of such rural markets comprises of a large number of smaller and big villages in the vicinity of the village where the market is held. Total catchment area of such markets may cover a distance of some 6-8 kms. comprising of 10-15 villages or even more.

The following are some of the important infrastructure and public utilities usually required in such markets:

- (1) Pucca open platforms
- (2) Shaded platforms
- (3) Pucca Shops
- (4) Space for Market Information Centre and Office for Market Management Committee

- (5) Room for Security Guard
- (6) Place for parking of cycles, scooters, buggies, horse-carts, tractor-trolleys, etc.
- (7) Storage facility
- (8) Electrification
- (9) Drainage facility
- (10) Boundary wall and Fencing around the haat area with the gates
- (11) Construction of Roads
- (12) Cattle Shed with drinking water facilities
- (13) Drinking wader
- (14) Toilets
- (15) Place for waste disposal
- (16) Plantation of trees

Management of the Market

Quite often the rural market is managed by the Gram Panchayat which realizes 'Tehbazari' from the traders. Another alternative arrangement is that the contract is awarded to a contractor for a stipulated amount per period and the contractor collects Tehbazari from the shopkeepers at predetermined rates. Gram Panchayat may form a "Market Management Committee" (MMC) to monitor the various activities of the market. The committee may take decisions on the mode of maintenance, management, rate of Tehbazari, method of its realization and settlement of disputes related to the market.

Construction of a market with covered and open pucca platforms, fencing around the area and facilities for storage, toilets, water supply, proper drainage and parking, etc.

can bring about an improvement in the conditions in such rural markets. Shopkeepers are willing to pay the 'Tehbazari' at higher rates provided proper facilities are developed.

Financial Analysis of Investment in Infrastructure

Initial investment is required on land and on capital cost involved in the creation of infrastructural facilities described above. Land for rural market could be the land owned by the Gram Panchayat, so that no investment is required to be made on this count.

Upkeep of the infrastructure is a must for the sustainability and trouble-free services. Below we provide estimates of expenditure (both capital and revenue type) required to be made in Sahansa market located in Araji Nines Block of Varanasi district, for which this feasibility study is being carried out (For details of the mathematical approach involved in this, see the Appendix given at the end).

XVII. FINANCIAL ANALYSIS OF PROPOSED INVESTMENT IN SAHANSA MARKET

Here we evaluate financial viability for providing facilities for the improvement of infrastructural facilities and other amenities in the rural market of Sahansa. Parameters involved in the financial analysis are detailed below:

1. Initial Capital Investment

Since the Sahansa market, at present; lacks infrastructural facilities therefore substantial amount will have to be spent on the modernisation of the market.

Platform/sheds need to be constructed, water supply is to be arranged and other infrastructural facilities are to be provided. All this would require capital expenditure. According to our estimate, Rs.9,00,000/- would be needed as initial capital, which will have to be spent over a time span of one year. This may be termed as initial capital investment. We also assume that the entire capital investment will be made instantaneously at the beginning of the year. This is not an unrealistic assumption.

2. Life Span of the Project

The market infrastructural facilities proposed to be provided in the Sahansa market would have usefulness for a fairly long period of time though depreciation is bound to take place with the passage of time. The actual life span of the project cannot be estimated with high degree of accuracy but on the basis of technical opinion of the Architect/Civil Engineer, it is assumed that the facilities proposed to be provided would last for a period of at least 15 years. It may not be unrealistic to assume that the facilities provided would remain useful even for a period of 20 years and above. In case of Sahansa market, we have taken the life span of the project to be 15 years. Thus, scrap value of the initial infrastructural facilities created at a cost of Rs.9,00,000 has been treated as 30% of the initial capital cost, i.e. Rs.2,70,000.

3. Cost of the Capital

Cost of the capital for project is a critical factor which determines the viability of project. Cost of capital based on the competitive interest rates prevailing in the market would be too high if considered for this market. For socially desirable activities, it is even

worthwhile to examine the financial viability at a relatively lower cost of capital. In practice also, the agencies involved in financing socially desirable activities encourage development of infrastructural facilities at a lower rate of capital cost. The projects so financed have plethora of social benefits, apart from financial benefits emanating from the project financed.

Keeping all this in view, 12 per cent annual cost of capital has been considered in the financial analysis of the Sahansa Market.

4. Cost of Repair and Maintenance

The proposed facilities to be provided in the market are bound to depreciate over the passage of time. Proper maintenance and upkeep of facilities in good condition is a social as well as economic necessity.

Keeping this objective in view, adequate provision has been made to account for the cost likely to arise on account of repair and maintenance. Items of expenditure under this head are as follows:

- (a) Expenditure on labour, materials and overheads for repair and maintenance of facilities;
- (b) Repair/Replacement of water pumps, electrical equipments and accessories etc. from time to time;
- (c) Salaries and wages payable to persons employed for the upkeep of facilities created by the project.

Details of annual maintenance expenditure are as follows:

1.	Watchman for Security @ Rs.1500 per month	Rs.18,000
2.	Sweeper for cleaning for 156 days @ Rs.40 per day	Rs. 6,240
3.	Electrical Maintenance for 156 days @ Rs.100 per day	Rs.15,600
4.	Maintenance of Handpump	Rs. 1,000
	Total	Rs.40,840

The above expenditure is expected to increase @ 5% annually.

Technical estimates suggest that there would be zero expenditure on repair and maintenance of the project during the first year. It is assumed that during second and third years, 2 per cent of the initial investment would be required for repair and maintenance. During the years 4 to 7, this will be 3% of the initial investment and thereafter @ 5 per cent of the initial capital investment will be needed for repair and maintenance of civil work and other infrastructural facilities till 15th year.

5. Revenues Arising from the Market

The completion of the market Improvement programme would result into substantial improvement in the working conditions of the Sahansa market. Farmers and traders would get a sizeable and respectable place to sit in and transact the business. They would be saved from the inconvenience arising due to limited space, open sale and bad weather. There is always a good-will value associated with a good looking shop.

As a result of improved facilities in the market it is expected that on account of availability of improved facilities the users of market would be willing to pay an increased market fee and rent for using these facilities.

Views of farmers/traders were solicited on the required increase in the market fee recoverable from them after market improvement programme is carried out. Incremental increase in revenue due to creation of infrastructural facilities has been put at Rs.1,35.400/- in the initial year. This is expected to go up @ 10% per annum.

NPV (Net Present Value) of Investments in the Projects

Based on the assumptions stated above, the sources of cash inflows and outflows are as follows:

Inflows

- (a) Expected increase in revenue (Beginning at Rs.1,35.400 per annum and going up @ 10% per annum)
- (b) Terminal value of initial investment (after 15 years from now) (30% of initial capital cost)

Outflows

- (c) Initial capital cost (Rs.9,00,000)
- (d) Cost of Repair and Maintenance (Rs.40,840 in the initial year and expected to increase @ 5% per annum)
- (e) Cost of maintenance of civil work and other infrastructural facilities (2% of capital cost in years 2 and 3, 3% in years 4 to 7, and 5% from years 8 onwards).

**Table 16: Computation of NPV and IRR on the basis of Expected Cash Flows
(Financial Point of View)**

Year	Addl Revenue Generated (based on increase @ 10% p a)	Terminal Value	Initial Capital Cost	Cost of Repair & Maintenance (based on increase @ 5% p a)	Rate of Increase in the Maintenance cost of civil work	Cost of Maintenance of Civil Work (based @ 2% of initial investment in years 2&3 and 5% thereafter)	Net Cash Flow
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
0			900000				(900000)
1							0
2	135400			40840	0.02	18000	76560
3	148940			42882	0.02	18000	88058
4	163834			45026	0.03	27000	91808
5	180217			47277	0.03	27000	105940
6	198239			49641	0.03	27000	121598
7	218063			52123	0.03	27000	138940
8	239869			54730	0.05	45000	140140
9	263856			57466	0.05	45000	161390
10	290242			60339	0.05	45000	184903
11	319266			63356	0.05	45000	210910
12	351193			66524	0.05	45000	239669
13	386312			69850	0.05	45000	271462
14	424943			73343	0.05	45000	306600
15	467438	270000		77010	0.05	45000	615428

NPV = 491; IRR = 12% per annum

Based on a cost of capita of 12%, the NPV of the project is Rs/491. However, with changes in the cost of capital the NPV of the project is as follows:

Table 17: Impact of Changes in Cost of Capital on Net Present Value

Cost of Capital	NPV (in Rs.)
0.06	608674
0.08	358756
0.10	159952
0.12	491
0.14	(128455)
0.15	(183637)
0.16	(233555)

Additional revenue arising due to the proposed investment on infrastructural facilities is required to be Rs.1,35,400 per annum in the initial year. However, if this falls short of the expectations, NPV becomes negative. In the tables below, the NPV and IRR are given for different amounts of additional revenue generated in the initial year ranging from Rs.130000 to as high as Rs.170000 along with the rates of growth in the revenues ranging from 5% per annum to 20% per annum.

Table 18 : Table Giving NPV at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)						
	130000	135500	140000	150000	160000	170000	
0.05	(360816)	(319084)	(284940)	(209064)	(133189)	(57313)	
0.06	(307639)	(263658)	(227673)	(147706)	(67740)	12227	
0.08	(189413)	(140430)	(100352)	(11292)	77769	166830	
0.10	(53258)	1488	46276	145811	245345	344879	
0.12	103690	165074	215298	326905	438512	550119	
0.14	284739	353783	410273	535807	661341	786875	
0.15	385472	458777	518754	652037	785319	918602	
0.20	1013620	1113501	119522	1376824	1558425	1740027	

Table 19 : Table Giving IRR at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)						
	130000	135500	140000	150000	160000	170000	
0.05	0.055	0.063	0.070	0.084	0.098	0.111	
0.06	0.067	0.075	0.082	0.096	0.109	0.122	
0.08	0.090	0.096	0.105	0.118	0.131	0.144	
0.10	0.112	0.120	0.126	0.140	0.152	0.164	
0.12	0.133	0.141	0.147	0.160	0.173	0.184	
0.14	0.154	0.161	0.167	0.180	0.192	0.204	
0.15	0.164	0.171	0.177	0.190	0.202	0.213	
0.20	0.211	0.218	0.224	0.236	0.248	0.260	

Accumulations in the Sinking Fund

Surpluses of revenues over expenditure can be used for further expansion of facilities in the market and for providing additional facilities to sellers and buyers. These funds can be invested in safe and profitable investment avenues with a view to get a lump sum amount of money which can be used for replacement of infrastructural facilities when they get decayed and outdated. The deposits in the fund are expected to be as follows, depending upon the rate of interest earned on investments:

Table 20: Table giving accumulated value of Deposits made in the Sinking Fund at Different Rates of Interest, as at the end of 15 years

Rate of Interest	Revenue of the Initial Year (Rs. in Lakh)					
	130000	135500	140000	150000	160000	170000
0.08	37.61	39.97	41.91	47.21	50.51	54.81
0.09	39.57	42.07	44.12	48.68	53.24	57.80
0.10	41.67	44.33	46.50	51.33	56.17	61.00
0.11	43.92	46.74	49.05	54.18	59.31	64.44
0.12	46.35	49.34	51.80	57.24	62.69	68.14
0.13	48.95	52.13	54.74	60.53	66.32	72.11
0.14	51.75	55.13	57.91	64.07	70.23	76.38
0.15	54.75	58.36	61.31	67.86	74.42	80.98

ECONOMIC ANALYSIS

The following intangible benefits of the investment are particularly noteworthy:

- (1) Increase in the value of transactions carried out in the market
- (2) Benefits for women
- (3) Technology dissemination and technology development

- (4) Reduction in spoilage
- (5) Dissemination of market intelligence
- (6) Encouragement in the trade of agricultural and horticultural produce

As is quite obvious, if we take into consideration the impact of the above mentioned intangible factors on the NPV or IRR of the project, then investment on infrastructure in a rural market becomes a highly profitable proposition. Detailed calculations incorporating various aspects of social cost benefit analysis have not been carried out.

We have considered in this study the financial dimensions of the project and have gathered information relating to financial viability. Ultimate success of the project would depend on how imaginatively the project is managed in all its aspects. In this regard, sound financial management is of great importance.

There are considerable moral and cultural benefits accruing from the investment. Such investment cannot be looked as an instrument merely for solving the problems of poverty and backwardness. The real contribution of the investment is in terms of enhancing the quality of life of the people in the region. The project would be advantageous from different view points.

Some such non-tangible benefits accruing from investment in the project are detailed below:

- (1) Markets are held under unhygienic conditions as at present. Food articles, vegetables are kept under exposed conditions and become carriers of diseases

and ailments. The project would create healthy and hygienic conditions and thereby the physical well being of the people would be improved.

- (2) Market is a place of social interaction. It is a venue where people belonging to the region converge for a day or two in a week and buy articles of daily consumption. Improved condition in the market enables people to buy good quality products and thus the quality of life would be improved.
- (3) Political and social reform activities are conducted through these markets. Improved conditions in the market would attract more and more people to come to the market and derive benefits.
- (4) Improved conditions in the market could lead to increased business activities and increased arrival of articles of consumption. More business transactions would be carried out through the market and consequently more employment as well as income generation opportunities would be opened up.
- (5) Consciousness about new products and technology, etc. would be spread through the market. This would lead to improvement in the living standards of people. Companies can launch new products and processes suited for local consumption through these markets.
- (6) Climatic conditions reach extreme level during summer, winter and rainy seasons. Conditions become extremely bad particularly during the rainy season and the arrivals of articles is adversely affected. During summer also, when temperature level reaches high, it becomes very difficult both for the traders as well as the customers to visit the market. During winter season also, chilly winds prevent

customers and traders to visit the market. Improved conditions would increase the number of days during which the markets are held.

- (7) When markets are not held regularly or when customers do not arrive in adequate numbers, agricultural produce particularly the perishable vegetables get spoiled or they have to be sold at low price resulting into loss for the producers as well as consumers. Poor and vulnerable sections of the society are particularly harmed on account of poor conditions in the market.
- (8) Improvement in the market would lead to increased economic activity in the region. It would lead to more efficient and effective utilization of the natural as well as man-power resources available in the region.
- (9) Cultural activities would be encouraged through improved working conditions. Social welfare and reform activities can also be carried out more easily by improving the conditions in the market.

In a nutshell, the conditions in the market indicate the level of development of civilization. The investment under consideration is a contribution towards civilizational development and thus carries within it several non-financial and non-economic benefits.

If these are taken into consideration, the true value of NPV and IRR is much higher than has been computed in the study. This is shown in the table below. Here we have added an amount equal to 10% of the incremental trading caused due to generation of infrastructural facilities in the market. Savings caused due to reduction in spoilage @ 2% of the additional trading have also been added.

Table 21 : Computation of NPV and IRR on the basis of Economic Analysis

Cash Flow on the basis of Financial Analysis	Benefits of Increase in Trading	Benefit due to Reduction in Spoilage	Total Cash Flow
76560	37855	7571	121986
88058	39748	7950	135756
91808	41735	8347	141890
105940	43822	8764	158527
121598	46013	9203	176814
138940	48314	9663	196916
140140	50730	10146	201015
161390	53266	10653	225310
184903	55927	11186	252018
210910	58726	11745	281281
239669	61662	12332	313663
271462	64745	12949	349156
306600	67983	13597	388180
615428	71382	14276	701086
NPV = 345165; IRR = 16.553%			

WORDS OF CAUTION

Financial viability of the project depends primarily on :

- (1) Surplus of Revenue over expenses (Net Cash Flow); and
- (2) The cost of capital.

In the table-22 given below, we have calculated the requirements of net cash flow based on different life spans of the project ranging between 15 to 40 years and on the basis of cost of capital ranging between 5% to 18% per annum for an initial investment of Rs.9 lakh on the infrastructural facilities in the market. The results are quite revealing in the sense that if the market fails to generate a minimum revenue as given in the table, the investment would not be financially viable proposition.

Table 22 : Table Giving Equivalent Annual Cost for Different Life Span of the Project at Different Costs of Capital

Cost of Capital (k)	Life of Project (n) (in Years)						
	15	20	25	30	35	40	
0.05	86708	72218	63857	58546	54965	52450	
0.06	92666	78466	70404	65384	62076	59815	
0.08	105147	91667	84311	79945	77223	75474	
0.10	118326	105714	99151	95471	93321	92033	
0.12	132142	120491	114750	111729	110085	109173	
0.15	153915	143785	139229	137070	136021	135506	
0.16	161422	151800	147611	145697	144803	144381	
0.18	176763	168138	164627	163136	162495	162216	

APPENDIXMATHEMATICAL APPROACH INVOLVED IN THE APPRAISAL OF
INVESTMENT ON INFRASTRUCTURE IN A RURAL MARKET

Let the initial investment on the development of infrastructural and public utilities in a market be Rs. 1. It takes about one year to complete the construction of the facilities and these are available for use after a period of one year since construction commences. It is assumed that incremental expenditure on maintenance of the facilities is incurred all at the end of every year and commences from the end of 2 years since construction starts. This same logic holds for incremental revenues also. The gap between incremental revenues and incremental expenditures (i.e. surplus of revenues over expenditures) is assumed to be Rs.X in the beginning (i.e. at the end of 2 years since construction etc. starts) and this increases in real term, @ g per annum. Useful life span of the initial investment is taken to be 14 years with an assumed depreciation @ 5% per annum simple, so that the terminal value of the infrastructural facilities created in the first year would remain to be 30% of the initial investment 1. Cost of capital is assumed to be 'k' per annum.

Based on the above logic,

$$I = \frac{X}{(1+k)(g-k)} \left[\frac{(1+g)^{14} - 1}{(1+k)^{15}} \right] X, \text{ and}$$

$$\left[(1+k)^{15} - 0.30 \right]$$

$$X = \frac{[(1+k)^{15} - 0.30] (1+k)(g-k)}{[(1+k)^{15} \left[\frac{(1+g)^{14}}{(1+k)^{14}} - 1 \right]]} I$$

If k and g are assumed to be 12% and 10% respectively, the above expression becomes

$$I = 10.53 \cdot X \cdot (Bx), \text{ or equivalently}$$

$$X = 0.095 \cdot I \cdot (C.I.)$$

If cost of capital (k) ranges between 6% to 15% and the growth in surplus (g) ranges between 5% to 20%, the following matrix giving the values of the coefficients involved in the above expression $X = .095 \cdot I$ is generated.

Table 23: Table giving the values of 'C' in the expression $X = C \cdot I$. at different rates of cost of capital and rates of growth

g = rate of growth in surplus of revenues over expenditures	k = Cost of capital					
	0.0600	0.0800	0.1000	0.1200	0.1400	0.1500
0.0500	0.0746	0.0900	0.1067	0.1246	0.1437	0.1538
0.0600	NA	0.0849	0.1009	0.1182	0.1367	0.1465
0.0800	0.0620	NA	0.0901	0.1061	0.1234	0.1326
0.1000	0.0546	0.0668	NA	0.0950	0.1110	0.1195
0.1200	0.0479	0.0589	0.0712	NA	0.0995	0.1074
0.1400	0.0419	0.0518	0.0629	0.0753	NA	0.0962
0.1500	0.0392	0.0486	0.0591	0.0709	0.0840	NA
0.2000	0.0277	0.0348	0.0429	0.0520	0.0624	0.0680

(X = Surplus of revenue over expenditure required to be generated at the end of year 2, I = Initial capital outlay, C = Coefficient values computed on the basis of the assumptions stated in the model)

The above table acts as a ready reckoner to ascertain the amount of surplus of revenues over expenditures required to be generated on annual basis with a constant annual growth rate of 'g' and a given cost of capital 'k' in order to justify (on the grounds of financial viability) the initial investment of Rs.1 in a market. As an example, if initial capital outlay on a market is Rs.10 lakhs, then $.095 \times \text{Rs.}1000000 = \text{Rs.}95000$ is the annual surplus of revenues over expenditures which is required to be generated at the end of the initial year (i.e. year 2) in which facilities are made available for use. This should grow annually @ 10% per annum ($g=.10$) in order to make the project viable from financial point of view.

Reciprocals of the values given in the table 21 above, gives the values of B in the expression $I = BX$. Results are as follows:

Table 24: Table giving the values of 'B' in the expression $I = BX$ at different rates of cost of capital and rates of growth

	$k = \text{Cost of capital}$						
	0.06	0.08	0.10	0.12	0.14	0.15	
$g = \text{rate of growth in surplus of revenues over expenditure}$	0.05	13.40	11.11	9.38	8.03	6.96	6.50
	0.06	NA	11.77	9.91	8.46	7.31	6.83
	0.08	16.13	NA	11.09	9.42	8.10	7.54
	0.10	18.32	14.98	NA	10.53	9.01	8.37
	0.12	20.88	16.97	14.05	NA	10.05	9.31
	0.14	23.85	19.29	15.89	13.28	NA	10.39
	0.15	25.52	20.58	16.91	14.10	11.91	NA
	0.20	36.04	28.73	23.32	19.21	16.03	14.71

The above table acts as a ready reckoner to ascertain the maximum amount of capital investment, which should be made on the expectation of a given amount of surpluses of revenues over expenditures. As an example, if it is expected that a surplus of Rs.95000 can be generated in the initial year, then the investment will remain financially viable upto a maximum investment of $Rs.10.53 \times 95000 = Rs.10$ lakhs. An initial investment of an amount less than Rs.10 lakhs, which can generate a surplus of at least Rs.95000 in the initial year, is of course, a good investment proposition. The above result is true for a cost of capital 12% and the annual growth of surplus of revenues over expenditure @ 10% per annum. Other values given in the table are interpreted similarly.

**BARAGAON RURAL MARKET
BLOCK BARAGAON
DISTRICT VARANASI**

II. LOCATION OF THE BARAGAON MARKET

Baragaon is a daily rural market held at Baragaon village located in Baragaon block of district Varanasi. The market is located approximately 26 kms. from district headquarter. To reach the market, one has to travel about 20 kms. on Varanasi-Babatpur road and then about 6 kms. more on Babatpur-Bhadohi road. The market of Baragaon, being primarily a wholesale market of vegetables, is not very old. It is held on the side of PWD road. However, some three-four private tin sheds-cum-godowns are also available for farmers/traders to keep their vegetables like potato, onion, etc. during off the marketing hours of the day.

The revenue collection from farmers/traders is being taken by private individuals who are involved in the wholesale trading business and providing their private tin shed and godowns to farmers/traders in Baragaon rural wholesale market. Thus, the existing market location being on the road side, any kind of improvement for better market infrastructural facilities is very difficult. The change in its location is required on gram panchayat land to provide better infrastructural facilities to farmers/traders involved in the sale of their produce and to channelize revenue, collected in the form of market fee, for market improvement through gram panchayat.

The detailed location of the existing market and alternative site owned by gram panchayat have been indicated in the enclosed map. The hinterland of Baragaon rural market is quite large, which consists of following 31 villages:

Name of the Village	Distance from the Market (kms.)
1. Baragaon	0.00
2. Fatteypur	1.50
3. Karampur	1.00
4. Koori	5.00
5. Sattanpur	2.00
6. Chilbila	5.00
7. Kumbhapur	6.00
8. Shervanipur	9.00
9. Bowlia	9.00
10. Kushmura	1.00
11. Khushialipur	1.00
12. Ishipur 2.00	
13. Gopalpur	4.00
14. Girdhavalpur	2.00
15. Pachrasi	1.50
16. Ramsinghpur	1.00
17. Bharatpur	1.00
18. Kushahi	1.00
19. Kavurampur	1.00
20. Khataura	1.50
21. Devachanpur	4.00
22. Bagia	3.00
23. Natwa	3.00
24. Dadwa 2.50	
25. Kharawan	5.00
26. Chek Kharawan	5.00
27. Adiyarpur	6.00
28. Sadhavganj	7.00
29. Anary	9.00
30. Bheti	8.00
31. Kaniyar	3.00

II. STRUCTURE OF THE MARKET

The field visit to the market for data collection and in-depth discussion with the Baragaon village pradhan, Block Pramukh and other knowledgeable persons of this area revealed that the structure of Baragaon rural market consists of about 169 shops of farmers/traders in any normal market day. Among the total shops of different commodities, vegetables shops are largest (150), followed by fruits shops (8), small eatables and miscellaneous of other eatables (8) and betel shops (3).

Out of total shops in the market, 10.06 per cent are owned by female farmers/traders. The shops dealing in the sale of vegetables and fruits in the market are found to be owned by 15 per cent and 25 per cent females respectively. In none of the other shop categories any shop is owned by female farmers/traders in Baragaon market. The commodity-wise total number of shops owned by male and female with their respective percentage share are shown in Table-1. The sample selection for the study constitutes more than 33 per cent as shown in Table 1.1.

Table-1 : Structure of the Baragaon Market

COMMODITIES	TOTAL SHOPS			PERCENTAGE OF TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	135(90.00)	15(10.00)	150(100.00)	88.82	88.24	88.76
Fruits	6(75.00)	2(25.00)	8(100.00)	3.95	11.65	4.73
Small Eatables	4(100.00)	--	4(100.00)	2.63	--	2.37
Tea shops	4(100.00)	--	4(100.00)	2.63	--	2.37
Betel Shops	3(100.00)	--	3(100.00)	1.97	--	1.76
Total	152(89.94)	17(10.06)	169(100.00)	100.00	100.00	100.0

Note : Figures in brackets indicate percentage.

Source: Based on field data.

लि. रुक्न - बड़ागाँव

BLOCK : BARAGAON
DISTRICT : VARANASI



पुलिस दोकी	●
संसदीय विधायिका	●/▲
संसदीय विधायिका	—
संसदीय विधायिका	—
संसदीय विधायिका	○/○

Table-1.1 : Sample of the Market

COMMODITIES	SELECTED SAMPLE SHOPS			PERCENTAGE OF SAMPLE SHOPS IN TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	43(87.76)	6(12.24)	49(100.00)	31.86	40.00	32.67
Fruits	3(75.00)	1(25.00)	4(100.00)	50.00	50.00	50.00
Total	46(84.91)	7(13.21)	53(100.00)	32.62	41.18	33.54

Note : Figures in brackets indicate percentage.

Source: Based on field data.

III. COMPOSITION OF THE MARKET

As shown in Table-2, the farmers and traders bring vegetables and fruits for sale in rural market for Baragaon. In each market days it is found that among all the sellers of vegetables and fruits, more than 78 per cent are the farmers and less than 22 per cent are the traders. In the group of vegetables shops 80 per cent belong to farmers and rest of 20 per cent to traders. But in case of fruits 50 per cent shops belong to farmers and rest 50 per cent to the traders in Baragaon market. Thus, in case of vegetables, which are the main arrival of this market, these are sold mainly by farmers located in the hinterland of the market. The phenomenon is indicative of the fact that Baragaon rural market has four distinctive features.

- (i) Baragaon rural market is local agricultural based daily market.
- (ii) This is primarily a market of potato and cauliflower;

- (iii) The market of Baragaon is a wholesale vegetable market and serves as main collection centre of this area
- (iv) Majority of market activities are run by local farmers.

Table-2: Farmers and Traders Composition in the Baragaon Market

Commodities	Farmers	Traders	Total
Vegetables	120(80.00)	30(20.00)	150 (100.00)
Fruits	04(50.00)	4(50.00)	08(100.00)
Total	124(78.48)	34(21.52)	158(100.00)

Source : Based on field data.

IV. COMPOSITION OF THE SAMPLE

Considering the existing share of total farmers and traders in selling of vegetables and fruits in Baragaon rural market, the sample covers 81.13 per cent farmers and 18.87 per cent traders in the sample of study. In case of vegetables sample constitutes 81.63 per cent farmers and remaining 18.37 per cent traders. In the group of fruits sample covers 75 per cent farmers and rest of the 25 per cent traders. A total of 53 shops constituting more than 31 per cent of total existing shops of the market are taken in study sample as shown in Table-3.

Table-3: Farmers and Traders Composition in the Sample of Baragaon Market

Commodities	Farmers	Traders	Total
Vegetables	40(81.63)	9(18.37)	49(100.00)
Fruits	03(75.00)	1(25.00)	04(100.00)
Total	43(81.13)	10(18.87)	53(100.00)

Source : Based on field data

V. TURN OVER OF AGRICULTURAL PRODUCE IN BARAGAON MARKET

The structure of Baragaon rural market indicates that this is primarily a market of vegetables produced in the villages of market hinterland. The structure further indicates that out of total 158 shops dealing in agricultural commodities 150 are engaged in the sale of vegetables only. The vegetables command major share followed by fruits. Data collected from sample shops showed that on an average 64 kgs. of vegetables were sold by each vegetables shop followed by more than 31 kgs. fruits per fruit shop. On the basis of this, the total quantity sold by all the shops per market day comes to 9900 kgs. and 250 kgs. in case of vegetables and fruits respectively. Thus, the average quantity of vegetables and fruits sold per market day is found to be 10014 kgs. in the wholesale market of Baragaon as is evident from Table-4.

Table-4: Actual Turn Over of Agricultural Produce in Baragaon Market

Commodities	No. of Shops in the Sample	Total Qty. Sold per Market Day by Sample Shops (Kg.)	Average Qty. sold per sample shop per market day (Kg.)	No. of Total shops in the market	Total Qty. sold by all shops per market day (Kg.)
Vegetables	49	3234	66.00	150	9900.00
Fruits	04	125	31.25	08	250.00
All Agricultural Produce	53	3359	63.38	158	10014.04

Source : Based on field data

One of the criterions of selection of rural haat/painth for feasibility study is that while selecting the market it should be ensured that either market turnover is more than 1000 MT per annum of all agricultural commodities or market has the potential to attain this target in coming days. The first part of this pre-condition of market selection is justified in case of Baragaon rural market because our estimates as shown in Table-5 based on primary data collected from sample farmers/traders selling their produce in this market indicated that this market has annual turnover of around 3705 MT of vegetables and fruits. The annual turnover of vegetables has been estimated to be 3613.50 MT followed by 91.25 MT of foodgrains as shown in Table-5.

Table-5 : Annual Turn Over of All Agricultural Produce in the Baragaon Market

Commodities	Turn Over (MT)
Vegetables	3613.50
Fruits	91.25
All Agricultural Produce	3704.75

Source : Based on field data

VI. PERSONS INVOLVED IN BUYING AND SELLING

As per our observation and data collection, there are 169 shops of different commodities per market day in Baragaon rural market. The average number of persons estimated to be engaged in selling is found to be more or less same (around one to two persons) in case of agricultural commodities and in the sale of non-agricultural items as shown in Table-6. It is further revealed through Table-6 that on an average 17 persons purchase from each shop of the market in a single market day. In case of vegetables and fruits average involvement of buyers per shop turns out to be 15 persons in each of the produce category. At the same time in case of non-agricultural commodities, higher number of persons made purchases from each shop. In total, 2800 persons are estimated to be involved in buying and selling of different commodities per market day. It further indicates, on account of multiple buying, a total number of around 2000 persons

are estimated to be involved in purchase of different commodities per market day in Baragaon market. Apart from this, about 190 persons are found to be engaged in selling of their produce in the market. Thus, total of around 2000 to 2200 persons are estimated to be present in a normal market day in the Baragaon rural market.

Table-6: Total and Average Number of Persons Involved in Selling and Buying Per Market Day in Baragaon Market

Commodities	No. of Persons Involved in Selling	Average No. of Persons Involved in Selling	Total No. of Persons Involved in Buying	Average No. of Persons Involved in Buying (No.)
Vegetables	168	1.12	2250	15.00
Fruits	8	1.00	120	15.00
Small Eatables	6	1.50	180	45.00
Tea shops	5	1.25	160	40.00
Betel shops	3	1.00	90	30.00
Total	190	1.12	2800	16.57

Source : Based on field data.

VII. MARKET FEE, REVENUE OBTAINED AND ITS POTENTIAL

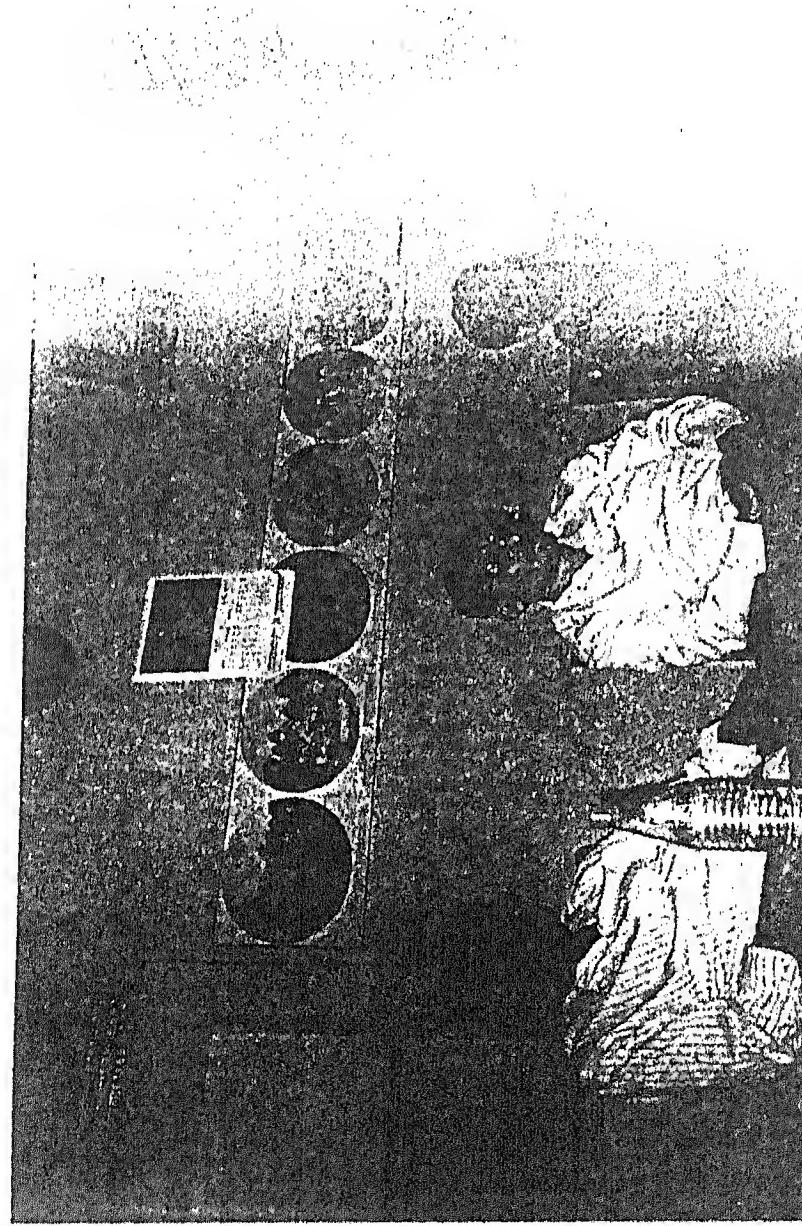
In course of detailed interview with different functionaries of Baragaon rural market, it is recorded that sellers pay Rs.22.50 to Rs.10 per shop per market day to

private contractor of the Baragaon market. The Gram Panchayat of Baragaon is not collecting any market fee from the farmers/traders selling their produce in this market. In this way a total average sum of Rs.3681 is collected per market day from Baragaon rural market. On the basis of existing market fee collection from each shop of the market, a sum of Rs.1343565/- is being collected per annum. Out of total collection, more than 92 per cent amount of market fee is being collected from farmers/traders selling vegetables in this market. Rest of the 8 per cent fee is collected from farmers/traders engaged in the sale of fruits and other eatables. In this way, total existing market fee from the Baragaon rural market is being collected by private contractors of the market. From the point of view of Gram Panchayat's earnings this may be deemed as potential market fee which can be collected after shifting the venue of present market of Baragaon at the proposed place (Table-7).

Table-7 : Present Potential of Market Fee in Baragaon Market

Commodities	Total Shops (No.)	Rate of Market Fee at Present (Rs.)	Actual Market Fee Per Market Day (Rs.)	Potential Market Fee Per Annum (Rs.)
Vegetables	150	22.50	3375	1231875
Fruits	8	22.00	175	64240
Small Eatables	4	15.00	60	21900
Tea Shops	4	10.00	40	14600
Betel shops	3	10.00	30	10950
Total	169	21.78	3681	1343565

Source : Based on field data.



Members of Study Team in The
Dive Center of Diving Institute

VIII. MODE OF TRANSPORT USED

For bringing the agricultural produce for sale in Baragaon rural market the farmers/traders are found to be using tractors, rickshaw and cycle as mode of transport. The most used mode of transport for agricultural produces is found to be cycle. Table-8 indicates that more than 66 per cent farmers/traders used cycle for transporting their produce in Baragaon rural market. The second most adopted transport mode is rickshaw trolley in this market. About 19 per cent farmers/traders are using rickshaw for transporting their product. Apart from these two modes, tractor trolley is also being used for the same by more than 15 per cent farmers/traders in Baragaon market. In fact Baragaon being a wholesale market, the use of tractor becomes viable and saves a lot of time for bringing vegetables in the market.

In case of vegetables all the three modes of transport, i.e. cycle, rickshaw and tractors are being used by 63.27 per cent, 20.40 per cent and 16.33 per cent farmers/traders respectively to bring their produce in the market. But for transporting fruits in the Baragaon market only cycle has been used as mode of transport by all the farmers/traders of this market.

Table-8: Traders Using Different Mode of Transport to Bring Agricultural Commodities

Commodities	Rickshaw Trolleys	Tractor Trolleys	Cycle	(No.) Total
Vegetables	10(20.41)	8(16.33)	31(63.27)	49(100.00)
Fruits	--	--	4(100.00)	4 (100.00)
Total	10(18.87)	8(15.09)	35(66.04)	53 (100.00)

Note : Figures given in brackets are percentage.
Source : Based on field data.

IX. DISTANCE COVERED TO REACH THE MARKET

The rural market of Baragaon is an important wholesale daily market of Baragaon area. Its hinterland extends to around 31 villages. All these villages are found to be located within 9 kms. from Baragaon market. However, maximum number of villages (30.19 per cent of the total villages) are located at the distance of 3 to 5 kms. from the place of the market. Other 24.53 per cent villages are within the radius of 1 km. from market place. Some 11.32 per cent villages are located at the distance of 5 to 7 kms. Remaining 6 sample villages (constituting 11.32 per cent of total villages) are located at the furtherest distance of 7 to 9 kms. from Baragaon rural market. On an average farmers/traders cover around 4 kms. to reach the market.

In case of vegetable farmers/traders 12.24 per cent cover a maximum distance of 7 to 9 kms. to reach the market. The maximum distance of 5 to 7 kms. is covered by 25 per cent farmers/traders dealing in the sale of fruits. All these characteristics point to the fact that Baragaon market is an important trading centre for the people residing in sizeable large area. Hence, its improvement is going to benefit large number of villages. In Table-9, classification of sample farmers/traders has been made in accordance with the commodities sold by them and distance covered .

Table-9 : Classification of Sample Farmers/Traders According to the Distance Covered to reach the Baragaon Market

Commodities	Distance Covered Area						(No.) Average Distance Covered
	0-1 (km.)	1-3 (kms.)	3-5 (kms.)	5-7 (kms.)	7-9 (kms.)	Total	
Vegetables	12 (24.49)	8 (16.33)	4 (28.57)	9 (18.37)	6 (12.24)	49 (100.0)	4.10
Fruits	1 (25.00)	--	2 (50.00)	1 (25.00)	--	4 (100.0)	4.25
Total	13 (24.53)	8 (15.09)	16 (30.19)	10 (18.87)	6 (11.32)	53 (100.0)	4.11

Note : Figures in brackets indicate percentage.

Source: Based on field data.

X. NEED OF IMPROVED FACILITIES

It is drawn from on the spot observation and informations of Baragaon rural market available so far that there is an immense scope and need for making available marketing infrastructural facilities. Therefore, utmost need is to provide improved facilities because all the sample farmers and traders have expressed their desire to have such facilities as shown in Table-10. It becomes obvious that farmers/traders selling different commodities in the market need improved facilities and all of them are willing to pay marginally higher market fee for using the improved market infrastructural facilities. Here in case of Baragaon rural market the fact remains that existing market fee is found to be sufficient to afford market improvement provided market fee is collected through Gram Panchayat.

Table-10 : Need of Improved Marketing Facilities in Baragaon Market

Commodities	Total No. of Farmers Shop	No. of Farmers Shops requiring improved facilities	No. of farmers willing to pay higher market fee	Total No. of Traders shop	No. of traders shop requiring improved facilities	No. of traders willing to pay higher market fee
Vegetables	40	40(100.00)	40(100.00)	9	9(100.00)	9(100.00)
Fruits	3	3(100.00)	3(100.00)	1	1(100.00)	1 (100.00)
Total	43	43	43	10	10	10

Note : Figures in brackets indicate percentage.

Source : Based on field data

XI. TYPE OF MARKETING FACILITIES REQUIRED

As it is seen that infrastructural facilities are largely lacking in Baragaon market, the farmers/traders who bring different agricultural produce for sale in this market were interviewed and encouraged to respond on the basis of PRA by innumerators of the study team regarding type of infrastructural facilities they require. The farmers/traders who responded to the questions of the study team are presented in Table-11. It is evident from information presented in the table that all farmers/traders are in need of the facilities like drinking water and electricity. Toilet, proper drainage system, permanent shops, platform, proper place for selling, shed, road, cycle stand and storage facility are some other important facilities reported to be required by 44 per cent to more than 92 per cent of existing farmers/traders dealing in the market of Baragaon.

Giving their view on type of infrastructural facilities required, all female farmers/traders coming in this market have reported requirement for proper drainage, toilets, drinking water and electricity. The second important type of facilities for them are found out to be the roads, proper place for sitting, permanent shops and tin sheds. These facilities are reported to be required by 86 per cent to 92 per cent of female farmers/traders coming in this market. Some other facilities like platform and storage are also demanded by sizeable number of female farmers/traders of this market as is evident from table-11.

Table-11 : Type of Marketing Infrastructural Facilities Required by the Farmers/Traders of Baragaon Market

Commodities	Total No. of Farmers/traders	Place	Drinking Water	Shed	Road	Platform	Electricity	Storage	Toilet	Permanent shop	Cycle stand	Proper drainage
Vegetables	49	31 (63.27)	49 (100.0)	31 (63.27)	29 (59.18)	34 (69.39)	49 (100.0)	21 (42.86)	46 (93.88)	44 (89.80)	26 (53.06)	44 (89.80)
	43	29 (67.44)	43 (100.0)	30 (69.77)	24 (55.81)	32 (74.42)	43 (100.0)	19 (44.19)	40 (93.02)	42 (97.87)	26 (60.47)	38 (88.37)
	6	2 (33.33)	6 (100.0)	1 (16.67)	5 (83.33)	2 (33.33)	6 (100.0)	2 (33.33)	6 (100.0)	2 (33.33)	-- --	6 (100.00)
FFruits	4	2 (50.00)	4 (100.0)	3 (75.00)	3 (75.00)	3 (75.00)	4 (100.0)	2 (50.00)	3 (75.00)	3 (75.00)	3 (75.00)	4 (100.0)
	3	1 (33.33)	3 (100.0)	2 (66.67)	2 (66.67)	2 (66.67)	3 (100.0)	1 (33.33)	2 (66.67)	2 (66.67)	3 (100.00)	3 (100.0)
	1	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	-- --	1 (100.0)
Total	53	33 (62.26)	53 (100.00)	34 (84.15)	32 (80.38)	37 (69.81)	53 (100.0)	23 (43.40)	49 (92.46)	47 (88.68)	29 (54.72)	48 (90.57)
	46	30 (65.22)	46 (100.00)	32 (89.57)	26 (56.52)	34 (73.91)	46 (100.0)	20 (43.48)	42 (91.30)	44 (95.85)	29 (63.04)	41 (89.13)
	7	3 (42.86)	7 (100.00)	2 (28.57)	6 (28.57)	3 (42.86)	7 (100.0)	3 (42.86)	7 (100.0)	3 (42.86)	-- --	7 (100.00)

Note : Figures in brackets indicate percentage.

Source : Based on field data.

XII. EXPECTED INCREASE IN ARRIVALS AFTER MARKET IMPROVEMENT

The foregoing analysis indicates that in the rural market of Baragaon : (i) market infrastructural facilities are mostly absent, (ii) the farmers/traders of the market want

improved facilities, and (iii) farmers/traders are already paying much more market fee than minimum required to create these facilities. In view of this, an attempts is being made to assess that how much increase in turnover of different agricultural commodities would result on account of provision of improved infrastructural facilities. This exercise has been presented in Table-12. It is shown in Table-12 that the arrivals of vegetables are expected to grow by more than 69 per cent and fruits by 158 per cent. In total, the arrivals of both types of agricultural commodities are expected to experience a growth of around 73 per cent per market day if improved market infrastructural facilities are made available in this market. The total increase in market arrivals of all the agricultural produce is estimated to increase on account of increase in arrivals of existing shops and also on account of increase in number of new shops of around twenty (20).

Table-12: Expected Increase in Arrivals of Agricultural Produce After Market Improvement in the Baragaon Market

Commodities	Vegetables	Fruits	All Agricultural Produce
Number of Sample Shops	49	4	53
Total Qty. expected to be sold by sample shops per market day (Kg.)	4945	215	5160
Average Qty. expected to be sold by sample shops per market day (kg.)	100.92	53.75	97.36
Total No. of Shops in the market	150	8	158
Total Qty. Expected to be sold per market day in existing shops (kg.)	15138.0	430.00	15382.88
Expected increase in number of Shops	16	4	20
Expected turnover of new entrants (kg.)	1614.72	215.00	1947.20
Total expected increase in turnover per market day (kg.)	16752.72	645.00	17330.08
Actual Qty. sold per market day (kg.)	9900.00	250.00	10014.04
Percentage Increase	69.22	158.00	73.06

Source : Based on field data.

XIII. EVALUATION OF ECONOMIC BENEFITS EMANATING FROM MARKET IMPROVEMENTS IN THE BARAGAON MARKET

Apart from channelizing fresh agriculture produce from farm level to final consumers there are other economic benefits which are likely to be generated in the process of market improvements. In fact, these benefits should be considered as an important factor and as a basis for taking up the task of Rural Market Improvement Programme. There are many economic benefits emanating from improved Rural Market infrastructure. These may broadly be grouped under following categories:

4. As an outcome of market improvements increased volume of agricultural produce resulting in comparatively lower or constant per unit marketing cost.
 5. Improved efficiency of market operations in the form of better product display, better facilities and availability of more marketing hours for the buyers and sellers result in higher per unit price of agricultural produce.
 6. Reduction in spoilage of perishable crops, vegetables and fruits with the availability of improved rural marketing infrastructure.
-
- I. It is very logical to put up the idea before farmers/traders of the market that for availing better market infrastructural facilities they should bear higher market fee. But in typical case of Baragaon rural wholesale market, any further hike in market fee per market day is not required because the existing market fee rates are more than enough to bear the cost of infrastructural facilities for market improvement. As a result of future market improvements some (30) new shops are expected to generate additional market

fee by joining the Baragaon market for availing improved infrastructural facilities in Baragaon wholesale market.

Table-13 presents the detailed picture of market fee collection from different traders/farmers for selling their produce under improved market conditions. As per Table-13, per market day average market fee collection from all existing shops estimated to be Rs.3681.00. The rate of market fee being same. The total market fee collection per market day is likely to increase because some 30 new shops will join the market on account of market improvement. Thus, total increased number (199) shops are likely to generate a sum of Rs.4314.00 as market fee per market day in Baragaon rural market. If we consider it on annual basis, the total increased average revenue is likely to be generated as Rs.157400.00.

Table-13 : Actual Market Fee Paid and Increased Market Fee Expected to be paid by Traders/Farmers of Baragaon Market

Commodities	Total No. of Shops	Present Potential of Market Fee (Per Market Day)	Expected Total No. of Shops After Market Improvement	Total Increased Market-Fee Required for Market Improvements (Per Market Day)
Vegetables	150	3375	166	3735.00
Fruits	8	176	12	264.00
Small Eatables	4	60	8	120.00
Tea Shops	4	40	7	105.00
Betels Shops	3	30	6	90.00
Total	169	3681	199	4314.00

Source : Based on field data

Despite increased market fee collection, in real terms, per unit cost of improved marketing facilities in case of all produces sold in the market either remains same or marginally low in case of Baragaon market. Table-14 shows that there will be no

increase in market fee collection hence there will not be any percentage increase in market fee collection in case of Baragaon rural market. As against this, due to increased market turn over of 5160 kgs. per market day per unit cost of marketing is likely to go down to Re.0.23 from Re.0.35 per kg. after market improvements. This shows that an overall 34.29 per cent reduction in per unit marketing cost is likely to be realized by the farmers/traders in Baragaon market after market improvements. The percentage reduction in per unit cost of marketing is likely to vary from 41.43 per cent to 35.29 per cent in case of different agricultural produces sold in the market. The estimated reduction in per unit marketing cost may go further down with the increased sale in the market in due course of future time. Thus, provision of improved market facilities coupled with reduced marketing cost from the very beginning after market improvements in Baragaon market may be considered to be a significant economic benefit.

Table-14 : Change in Marketing Cost Before and After Market Improvement

Commodities	Present Market Turn Over of Sample Shops (Per Market Day) (Kg.)	Total Market Fee can be Collected from Sample Shops Per Market Day at Present (Rs.)	Expected Market Turn-over after market improvement in sample shops (Kg.)	Total Required Collection as Market Fee from Sample Shops (Rs.)	Percentage Increase in Fee Collection after Market Improvement (Rs.)	% reduction in Per Unit Marketing Cost (Rs.)
Vegetables	3234	1102.5(0.34)	4945	1102.50(0.22)		35.29
Fruits	125	88.0(0.70)	215	88.00(0.41)		41.43
All Agricultural Produce	3359	1190.5(0.35)	5160	1190.50(0.23)		34.29

Note : Figures in parentheses denote per unit cost of marketing.

Source : Based on field data

II. With the availability of improved marketing facilities and infrastructure in the daily market of Baragaon farmers/traders are expected to maintain the quality of their products to be sold in the market. In other words, they will be able to bring their produce in the market in a more presentable manner. Buyers will also feel more comfortable and confident while purchasing the agricultural produce under improved marketing conditions. Under such improved market conditions sellers of produce may very easily justify at least 5 per cent increase in the prices of their produce. As there would be no increase in per unit cost of marketing of agricultural produce. The hike in commodity prices would be a net gain to the farmers/traders selling their produce in the market of Baragaon.

Table-15 exemplifies the net gain coming out of 5 per cent hike in average prices of agricultural and other produces on account of improved market efficiency in the rural market of Baragaon. These estimates are based on quantity and prices of vegetables and fruits recorded from sample shop owners in Baragaon rural market of Baragaon block in district Varanasi. However, the estimates are approximate because the factor of seasonality has not been taken into consideration. It is evident from figures that under this process the highest gainers are farmers/traders engaged in the trading of vegetables followed by farmers/traders dealing in fruits. Figures presented in Table-15 also show that all the farmers/traders involved in the trading may gain a sum of Rs.893826.60 per annum with the introduction of market improvement at the new market site in Baragaon rural wholesale market.

Table-15 : Estimation of Net Gain in Marketing Under Market Improvement

Commodities	Estimated Total Value of Commodities sold per market at present (Rs.)	Estimated value of commodities to be sold per market day after market improvements (at current prices) (Rs.)	Estimated Value of Commodities to be sold after market improvements 5% high prices (Rs.)	Net gain per market day (Rs.)	Net gain per annum (Approx.) (Rs.)
Vegetables	24750	41881.80	43975.89	2094.09	764342.85
Fruits	2750	7095.00	7449.75	354.75	129483.75
Total	27500	48976.80	51425.64	2448.84	893826.60

Source : Based on field data

Other indirect economic benefits are also involved in the process of efficient marketing system. A transparent and efficient system, as suggested for Baragaon market, will reduce the interference of middlemen and brokers in the determination of agriculture and other produce prices in the market. This will result into the direct benefit to farmers/traders on account of increased prices. This gain may lead to expansion of agricultural activities, resulting in higher production in the hinterland of Baragaon market.

III. Erection of marketing infrastructural facilities in Baragaon market may provide special benefit in the trading of perishable produce like vegetables and fruits. In case of vegetables and fruits, availability of facilities like water shed, light and storage may reduce at least 20 per cent spoilage of arrivals in the Baragaon market.

Data relating to proportion of vegetables in total market turn over of agricultural produce come around 58 per cent in Baragaon market. It is expected to go higher with the availability of above listed infrastructural facilities. In case of fruits the spoilage rate is found to be over 40 per cent during the peak season in this market.

With the availability of watershed and storage, the spoilage rate under such conditions may go down to less than 20 per cent. In case of meat and fish marketing (in case it is brought in market), the availability of better infrastructural facilities will reduce the spoilage of these produce to a considerable extent. Apart from this, the hygienic conditions will also be maintained with the availability of these facilities in the market. Under the ordinary conditions the spoilage of fruits and meat products is 25 to 35 per cent and it could be reduced to 15 to 10 per cent with the availability of required infrastructural facilities in Baragaon market of Baragaon block.

XVI. FINANCIAL AND ECONOMIC APPRAISAL OF INVESTMENT IN RURAL MARKET OF BARAGAON

Introduction

Rural markets are a hub-centre of socio-economic activities in a region. Along with public services such as Primary Health Centre, Veterinary Hospital, Post Office, Bank, Educational Institutions, Play Ground, PCO, Police Station, etc., they provide a fillip to the tempo of social, cultural and economic growth of the region comprising of a number of villages from where buyers and sellers of goods and services are attracted to these markets.

Existing conditions in some such markets are far from satisfactory. A typical market may consist of some stalls of a temporary nature and sellers sit on ground and on chabutras of houses and shops, open to sky without any shed or cover. Quite often they are held once, twice or thrice a week during the afternoon hours. Some may be the daily markets also.

The products traded in such markets include vegetables, fruits, flowers, edible oil, spices, jaggery, foodgrains, meat, fish, ready made wears, chappals, sweets, chhats, general goods and services of cobblers, smiths, barbers, etc. Arrival of commodities in the market fluctuates, depending upon the season and other factors.

Catchment area of such rural markets comprises of a large number of smaller and big villages in the vicinity of the village in which the market is held. Total catchment area of such markets may cover a distance of some 6-8 kms. comprising of 10-15 villages or even more.

The following are some of the important infrastructure and public utilities usually required in such markets:

- (1) Pucca open platforms
- (2) Shaded platforms
- (3) Pucca Shops
- (4) Space for Market Information Centre and Office for Market Management Committee
- (5) Room for Security Guard
- (6) Place for parking of cycles, scooters, buggies, horse-carts, tractor-trolleys, etc.
- (7) Storage facility

- (8) Electrification
- (9) Drainage facility
- (10) Boundary wall and Fencing around the haat area with the gates
- (11) Construction of Roads
- (12) Cattle Shed with drinking water facilities
- (13) Drinking wader
- (14) Toilets
- (15) Place for waste disposal
- (16) Plantation of trees

Management of the Market

Quite often the rural market is managed by the Gram Panchayat which realizes 'Tehbazari' from the traders. Another alternative arrangement is that the contract is awarded to a contractor for a stipulated amount per period and the contractor collects Tehbazari from the shopkeepers at predetermined rates. Gram Panchayat may form a "Market Management Committee" (MMC) to monitor the various activities of the market. The committee may take decisions on the mode of maintenance, management, rate of Tehbazari, method of its realization and settlement of disputes related to the market.

Construction of a market with covered and open pucca platforms, fencing around the area and facilities for storage, toilets, water supply, proper drainage and parking, etc. can bring about an improvement in the conditions in such rural markets. Shopkeepers are willing to pay the 'Tehbazari' at higher rates provided proper facilities are developed.

Financial Analysis of Investment in Infrastructure

Initial investment is required on land and on capital cost involved in the creation of infrastructural facilities described above. Land for rural market could be the land owned by the Gram Panchayat, so that no investment is required to be made on this count.

Upkeep of the infrastructure is a must for the sustainability and trouble-free services. Below we provide estimates of expenditure (both capital and revenue type) required to be made in Baragaon market located in Baragaon Block of Varanasi District, for which this feasibility study is being carried out (For details of the mathematical approach involved in this, see the Appendix given at the end).

XVII. FINANCIAL ANALYSIS OF PROPOSED INVESTMENT IN BARAGAON MARKET

Here we evaluate financial viability for providing facilities for the improvement of infrastructural facilities and other amenities in the rural market of Baragaon. Parameters involved in the financial analysis are detailed below:

1. Initial Capital Investment

Since the Baragaon market, at present, lacks infrastructural facilities therefore substantial amount will have to be spent on the modernisation of the market. Platform/sheds need to be constructed, water supply is to be arranged and other infrastructural facilities are to be provided. All this would require capital expenditure. According to our estimate, Rs.12,00,00/- would be needed as initial capital, which will

have to be spent over a time span of one year. This may be termed as initial capital investment. We also assume that the entire capital investment will be made instantaneously at the beginning of the year. This is not an unrealistic assumption.

2. Life Span of the Project

The market infrastructural facilities proposed to be provided in the Baragaon market would have usefulness for a fairly long period of time though depreciation is bound to take place with the passage of time. The actual life span of the project cannot be estimated with high degree of accuracy but on the basis of technical opinion of the Architect/Civil Engineer, it is assumed that the facilities proposed to be provided would last for a period of at least 15 years. It may not be unrealistic to assume that the facilities provided would remain useful even for a period of 20 years and above. In case of Baragaon market, we have taken the life span of the project to be 15 years. Thus, scrap value of the initial infrastructural facilities created at a cost of Rs.12,00,000 has been treated as 30% of the initial capital cost.

3. Cost of the Capital

Cost of the capital for project is a critical factor which determines the viability of project. Cost of capital based on the competitive interest rates prevailing in the market would be too high if considered for this market. For socially desirable activities, it is even worthwhile to examine the financial viability at a relatively lower cost of capital. In practice also, the agencies involved in financing socially desirable activities encourage development of infrastructural facilities at a lower rate of capital cost. The projects so

financed have plethora of social benefits, apart from financial benefits emanating from the project financed.

Keeping all this in view, 12 per cent annual cost of capital has been considered in the financial analysis of the Baragaon Market.

4. Cost of Repair and Maintenance

The proposed facilities to be provided in the market are bound to depreciate over the passage of time. Proper maintenance and upkeep of facilities in good condition is a social as well as economic necessity.

Keeping this objective in view, adequate provision has been made to account for the cost likely to arise on account of repair and maintenance. Items of expenditure under this head are as follows:

- (a) Expenditure on labour, materials and overheads for repair and maintenance of facilities;
- (b) Repair/Replacement of water pumps, electrical equipments and accessories etc. from time to time;
- (c) Salaries and wages payable to persons employed for the upkeep of facilities created by the project.

Details of annual maintenance expenditure are as follows:

1.	Watchman for Security @ Rs.1500 per month	Rs.18,000
2.	Sweeper for cleaning for 104 days @ Rs.40 per day	Rs. 14,600
3.	Electrical Maintenance for 104 days @ Rs.100 per day	Rs.34,500
4.	Maintenance of Handpump	Rs. 1,000
<hr/>		
	Total	Rs.70,100
<hr/>		
The above expenditure is expected to increase @ 5% annually.		

Technical estimates suggest that there would be zero expenditure on repair and maintenance of the project during the first year. It is assumed that during second and third years, 2 per cent of the initial investment would be required for repair and maintenance. During the years 4 to 7, this will be 3% of the initial investment and thereafter @ 5 per cent of the initial capital investment will be needed for repair and maintenance of civil work and other infrastructural facilities till 15th year.

5. Revenues Arising from the Market

The completion of the market improvement programme would result into substantial improvement in the working conditions of the Baragaon market. Farmers and traders would get a sizeable and respectable place to sit in and transact the business.

They would be saved from the inconvenience arising due to limited space, open sale and bad weather. There is always a good-will value associated with a good looking shop.

As a result of improved facilities in the market it is expected that on account of availability of improved facilities the users of market would be willing to pay an increased market fee and rent for using these facilities.

Views of farmers/traders were solicited on the required market fee recoverable from them after market improvement programme is carried out. Incremental increase in revenue due to creation of infrastructural facilities has been put at Rs.1574000 in the initial year. This is expected to go up @ 10% per annum.

NPV (Net Present Value) of Investments in the Projects

Based on the assumptions stated above, the sources of cash inflows and outflows are as follows:

Inflows

- (a). Expected increase in revenue (Beginning at Rs.15,74,000 per annum and going up @ 10% per annum)
- (b) Terminal value of initial investment (after 15 years from now) (30% of initial capital cost)

Outflows

- (c) Initial capital cost (Rs.12,00,000)
- (d) Cost of Repair and Maintenance (Rs.70100 in the initial year and expected to increase @ 5% per annum)

(e) Cost of maintenance of civil work and other infrastructural facilities (2% of capital cost in years 2 and 3, 3% in years 4 to 7, and 5% from years 8 onwards).

Table 16: Computation of NPV and IRR on the basis of Expected Cash Flows (Financial Point of View)

Year	Addl. Revenue Generated (based on increase @ 10% p.a.)	Terminal Value	Initial Capital Cost	Cost of Repair & Maintenance (based on increase @ 5% p.a.)	Rate of Increase in the Maintenance cost of civil work	Cost of Maintenance of Civil Work (based @ 2% of initial investment in years 2&3 and 5% thereafter)	Net Cash Flow
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
0			1200000				(1200000)
1							0
2	1574000			70100	0.02	24000	1479900
3	1731400			73605	0.02	24000	1633795
4	1904540			77285	0.03	36000	1791225
5	2094994			81150	0.03	36000	1977844
6	2304493			85207	0.03	36000	2183286
7	2534943			89467	0.03	36000	2409475
8	2788437			93941	0.05	60000	2634496
9	3067281			98638	0.05	60000	2908643
10	3374009			103570	0.05	60000	3210439
11	3711410			108748	0.05	60000	3542662
12	4082551			114186	0.05	60000	3908365
13	4490806			119895	0.05	60000	4310911
14	4939886			125890	0.05	60000	4753997
15	5433875	360000		132184	0.05	60000	5601691

NPV = Rs.13751692; IRR = 79% per annum

Based on a cost of capita of 12%, the NPV of the project is Rs.13751692.

However, with changes in the cost of capital the NPV of the project is as follows:

Table 17: Impact of Changes in Cost of Capital on Net Present Value

Cost of Capital	NPV (in Rs.)
0.06	22964251
0.08	19216634
0.10	16199863
0.12	13751692
0.14	11749258
0.15	10884984
0.16	10098838

Additional revenue arising due to the proposed investment on infrastructural facilities is expected to be Rs.15,74,000 per annum in the initial year. However, if this falls short of the expectations, NPV becomes negative. In the tables below, the NPV and IRR are given for different amounts of additional revenue generated in the initial year ranging from Rs.1500000 to as high as Rs.1675000 along with the rates of growth in the revenues ranging from 5% per annum to 20% per annum.

Table 18 : Table Giving NPV at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)						
	1500000	1574000	1600000	1625000	1650000	1675000	
0.05	9466389	10027871	10225148	10414837	10604527	10794217	
0.06	10079971	10671722	10879635	11079551	11279467	11479383	
0.08	11444117	10103166	12334724	12557375	12780027	13002679	
0.10	13015139	13751692	14010481	14259317	14508152	14756988	
0.12	14826081	15651974	15942153	16221170	16500188	16779206	
0.14	16915104	17844056	18170444	18484279	18798114	19111949	
0.15	16077402	19063693	19410228	19743435	20076641	20409648	
0.20	25325270	26669123	27141287	27595292	28049296	28503301	

Table 19 : Table Giving IRR at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)						
	1500000	1574000	1600000	1625000	1650000	1675000	
0.05	0.727	0.752	0.761	0.769	0.778	0.786	
0.06	0.734	0.760	0.768	0.777	0.785	0.793	
0.08	0.750	0.775	0.784	0.792	0.800	0.809	
0.10	0.765	0.790	0.799	0.807	0.815	0.824	
0.12	0.780	0.805	0.814	0.822	0.830	0.839	
0.14	0.796	0.820	0.829	0.837	0.846	0.854	
0.15	0.803	0.828	0.837	0.845	0.853	0.861	
0.20	0.842	0.866	0.875	0.883	0.891	0.899	

Accumulations in the Sinking Fund

Surpluses of revenues over expenditure can be used for further expansion of facilities in the market and for providing additional facilities to sellers and buyers. These funds can be invested in safe and profitable investment avenues with a view to get a lump sum amount of money which can be used for replacement of infrastructural facilities when they get decayed and outdated. The deposits in the fund are expected to be as follows, depending upon the rate of interest earned on investments:

Table 20: Table giving accumulated value of Deposits made in the Sinking Fund at Different Rates of Interest, as at the end of 15 years

Rate of Interest	Revenue of the Initial Year (Rs. in Lakh)					
	1500000	1574000	1600000	1625000	1650000	1675000
0.08	615.82	647.65	658.83	669.59	680.34	691.10
0.09	652.08	685.81	697.66	709.05	720.45	731.84
0.10	691.07	726.84	739.40	751.48	763.57	775.65
0.11	732.99	770.95	784.29	797.11	809.93	822.76
0.12	778.07	818.39	832.56	846.18	859.80	873.42
0.13	826.57	869.42	884.47	898.95	913.43	927.91
0.14	878.73	924.31	940.33	955.72	971.12	986.52
0.15	934.85	983.36	1000.41	1016.80	1033.19	1049.58

ECONOMIC ANALYSIS

The following intangible benefits of the investment are particularly noteworthy:

- (1) Increase in the value of transactions carried out in the market
- (2) Benefits for women
- (3) Technology dissemination and technology development
- (4) Reduction in spoilage
- (5) Dissemination of market intelligence
- (6) Encouragement in the trade of agricultural and horticultural produce

As is quite obvious, if we take into consideration the impact of the above mentioned intangible factors on the NPV or IRR of the project, then investment on infrastructure in a rural market becomes a highly profitable proposition. Detailed

calculations incorporating various aspects of social cost benefit analysis have not been carried out.

We have considered in this study the financial dimensions of the project and have gathered information relating to financial viability. Ultimate success of the project would depend on how imaginatively the project is managed in all its aspects. In this regard, sound financial management is of great importance.

There are considerable moral and cultural benefits accruing from the investment. Such investment cannot be looked as an instrument merely for solving the problems of poverty and backwardness. The real contribution of the investment is in terms of enhancing the quality of life of the people in the region. The project would be advantageous from different view points.

Some such non-tangible benefits accruing from investment in the project are detailed below:

- (1) Markets are held under unhygienic conditions as at present. Food articles, vegetables are kept under exposed conditions and become carriers of diseases and ailments. The project would create healthy and hygienic conditions and thereby the physical well being of the people would be improved.
- (2) Market is a place of social interaction. It is a venue where people belonging to the region converge for a day or two in a week and buy articles of daily consumption. Improved condition in the market enables people to buy good quality products and thus the quality of life would be improved.

- (3) Political and social reform activities are conducted through these markets. Improved conditions in the market would attract more and more people to come to the market and derive benefits.
- (4) Improved conditions in the market could lead to increased business activities and increased arrival of articles of consumption. More business transactions would be carried out through the market and consequently more employment as well as income generation opportunities would be opened up.
- (5) Consciousness about new products and technology, etc. would be spread through the market. This would lead to improvement in the living standards of people. Companies can launch new products and processes suited for local consumption through these markets.
- (6) Climatic conditions reach extreme level during summer, winter and rainy seasons. Conditions become extremely bad particularly during the rainy season and the arrivals of articles is adversely affected. During summer also, when temperature level reaches high, it becomes very difficult both for the traders as well as the customers to visit the market. During winter season also, chilly winds prevent customers and traders to visit the market. Improved conditions would increase the number of days during which the markets are held.
- (7) When markets are not held regularly or when customers do not arrive in adequate numbers, agricultural produce particularly the perishable vegetables get spoiled or they have to be sold at low price resulting into loss for the producers as well as consumers. Poor and vulnerable sections of the society are particularly harmed on account of poor conditions in the market.

- (8) Improvement in the market would lead to increased economic activity in the region. It would lead to more efficient and effective utilization of the natural as well as man-power resources available in the region.
- (9) Cultural activities would be encouraged through improved working conditions. Social welfare and reform activities can also be carried out more easily by improving the conditions in the market.

In a nutshell, the conditions in the market indicate the level of development of civilization. The investment under consideration is a contribution towards civilizational development and thus carries within it several non-financial and non-economic benefits.

If these are taken into consideration, the true value of NPV and IRR is much higher than has been computed in the study. This is shown in the table below. Here we have added an amount equal to 10% of the incremental trading caused due to generation of infrastructural facilities in the market. Savings caused due to reduction in spoilage @ 2% of the additional trading have also been added.

Table 21 : Computation of NPV and IRR on the basis of Economic Analysis

Cash Flow on the basis of Financial Analysis	Benefits of Increase in Trading	Benefit due to Reduction in Spoilage	Total Cash Flow
1479900	89383	17877	1587159
1633795	93852	18770	1746417
1791255	98544	19709	1909508
1977844	103472	20694	2102010
2183286	108645	21729	2313661
2409475	114077	22815	2546368
2634496	119781	23956	2778234
2908643	125770	25154	3059567
3210439	132059	26412	3368910
3542662	136662	27732	3709956
3908365	145595	29119	4083079
4310911	152875	30575	4494361
4753997	180518	32104	4946619
5601691	168544	33709	5803944
NPV = 14565531; IRR = 82.333%			

WORDS OF CAUTION

Financial viability of the project depends primarily on :

- (1) Surplus of Revenue over expenses (Net Cash Flow); and
- (2) The cost of capital.

In the table-22 given below, we have calculated the requirements of net cash flow based on different life spans of the project ranging between 15 to 40 years and on the basis of cost of capital ranging between 5% to 18% per annum for an initial investment of Rs.12,00,000 on the infrastructural facilities in the market. The results are quite

revealing in the same that if the market fails to generate a minimum revenue as given in the table, the investment would not be financially viable proposition.

Table 22 : Table Giving Equivalent Annual Cost for Different Life Span of the Project at Different Costs of Capital

Cost of Capital (k)	Life of Project (n) (in Years)					
	15	20	25	30	35	40
0.05	115611	96291	85143	78062	73286	69934
0.06	123555	104621	93872	87179	82769	79754
0.08	140195	122223	112415	106593	102964	100632
0.10	157769	140952	132202	127295	124428	122711
0.12	176189	160655	153000	148972	146780	145564
0.15	205220	191714	185639	182760	181362	180675
0.16	215229	202400	196815	194263	193071	192508
0.18	235683	224184	219503	217517	216661	216288

APPENDIXMATHEMATICAL APPROACH INVOLVED IN THE APPRAISAL OF
INVESTMENT ON INFRASTRUCTURE IN A RURAL MARKET

Let the initial investment on the development of infrastructural and public utilities in a market be Rs. 1. It takes about one year to complete the construction of the facilities and these are available for use after a period of one year since construction commences. It is assumed that incremental expenditure on maintenance of the facilities is incurred all at the end of every year and commences from the end of 2 years since construction starts. This same logic holds for incremental revenues also. The gap between incremental revenues and incremental expenditures (i.e. surplus of revenues over expenditures) is assumed to be Rs.X in the beginning (i.e. at the end of 2 years since construction etc. starts) and this increases in real term, @ g per annum. Useful life span of the initial investment is taken to be 14 years with an assumed depreciation @ 5% per annum simple, so that the terminal value of the infrastructural facilities created in the first year would remain to be 30% of the initial investment 1. Cost of capital is assumed to be 'k' per annum.

Based on the above logic,

$$I = \frac{X}{(1+k)(g-k)} \cdot \frac{1}{[(1+k)^{15} - 0.30]} \quad X, \text{ and}$$

$$\frac{1+g}{1+k}^{14} - 1 \quad (1+k)^{15}$$

$$X = \frac{[(1+k)^{15} - 0.30] (1+k)(g-k)}{[(1+k)^{15} \left(\frac{(1+g)^{14}}{(1+k)^{14}} - 1 \right)]}$$

If k and g are assumed to be 12% and 10% respectively, the above expression becomes

$$I = 10.53 \cdot X \cdot (Bx), \text{ or equivalently}$$

$$X = 0.095 \cdot I \quad (C \cdot I)$$

If cost of capital (k) ranges between 6% to 15% and the growth in surplus (g) ranges between 5% to 20%, the following matrix giving the values of the coefficients involved in the above expression $X = .095 \cdot I$ is generated.

Table 23: Table giving the values of 'C' in the expression $X = C \cdot I$, at different rates of cost of capital and rates of growth

$g = \text{rate of growth in surplus of revenues over expenditures}$	$k = \text{Cost of capital}$						
	0.0600	0.0800	0.1000	0.1200	0.1400	0.1500	
0.0500	0.0746	0.0900	0.1067	0.1246	0.1437	0.1538	
0.0600	NA	0.0849	0.1009	0.1182	0.1367	0.1465	
0.0800	0.0620	NA	0.0901	0.1061	0.1234	0.1326	
0.1000	0.0546	0.0668	NA	0.0950	0.1110	0.1195	
0.1200	0.0479	0.0589	0.0712	NA	0.0995	0.1074	
0.1400	0.0419	0.0518	0.0629	0.0753	NA	0.0962	
0.1500	0.0392	0.0486	0.0591	0.0709	0.0840	NA	
0.2000	0.0277	0.0348	0.0429	0.0520	0.0624	0.0680	

($X = \text{Surplus of revenue over expenditure required to be generated at the end of year 2}$, $I = \text{Initial capital outlay}$, $C = \text{Coefficient values computed on the basis of the assumptions stated in the model}$)

The above table acts as a ready reckoner to ascertain the amount of surplus of revenues over expenditures required to be generated on annual basis with a constant annual growth rate of 'g' and a given cost of capital 'k' in order to justify (on the grounds of financial viability) the initial investment of Rs.1 in a market. As an example, if initial capital outlay on a market is Rs.10 lakhs, then $.095 \times$ Rs.1000000 = Rs.95000 is the annual surplus of revenues over expenditures which is required to be generated at the end of the initial year (i.e. year 2) in which facilities are made available for use. This should grow annually @ 10% per annum ($g=10$) in order to make the project viable from financial point of view.

Reciprocals of the values given in the table 21 above, gives the values of B in the expression $I = BX$. Results are as follows:

Table 24: Table giving the values of 'B' in the expression $I = BX$ at different rates of cost of capital and rates of growth

$g = \text{rate of growth in surplus of revenues over expenditure}$	$k = \text{Cost of capital}$					
	0.06	0.08	0.10	0.12	0.14	0.15
0.05	13.40	11.11	9.38	8.03	6.96	6.50
0.06	NA	11.77	9.91	8.46	7.31	6.83
0.08	16.13	NA	11.09	9.42	8.10	7.54
0.10	18.32	14.98	NA	10.53	9.01	8.37
0.12	20.88	16.97	14.05	NA	10.05	9.31
0.14	23.85	19.29	15.89	13.28	NA	10.39
0.15	25.52	20.58	16.91	14.10	11.91	NA
0.20	36.04	28.73	23.32	19.21	16.03	14.71

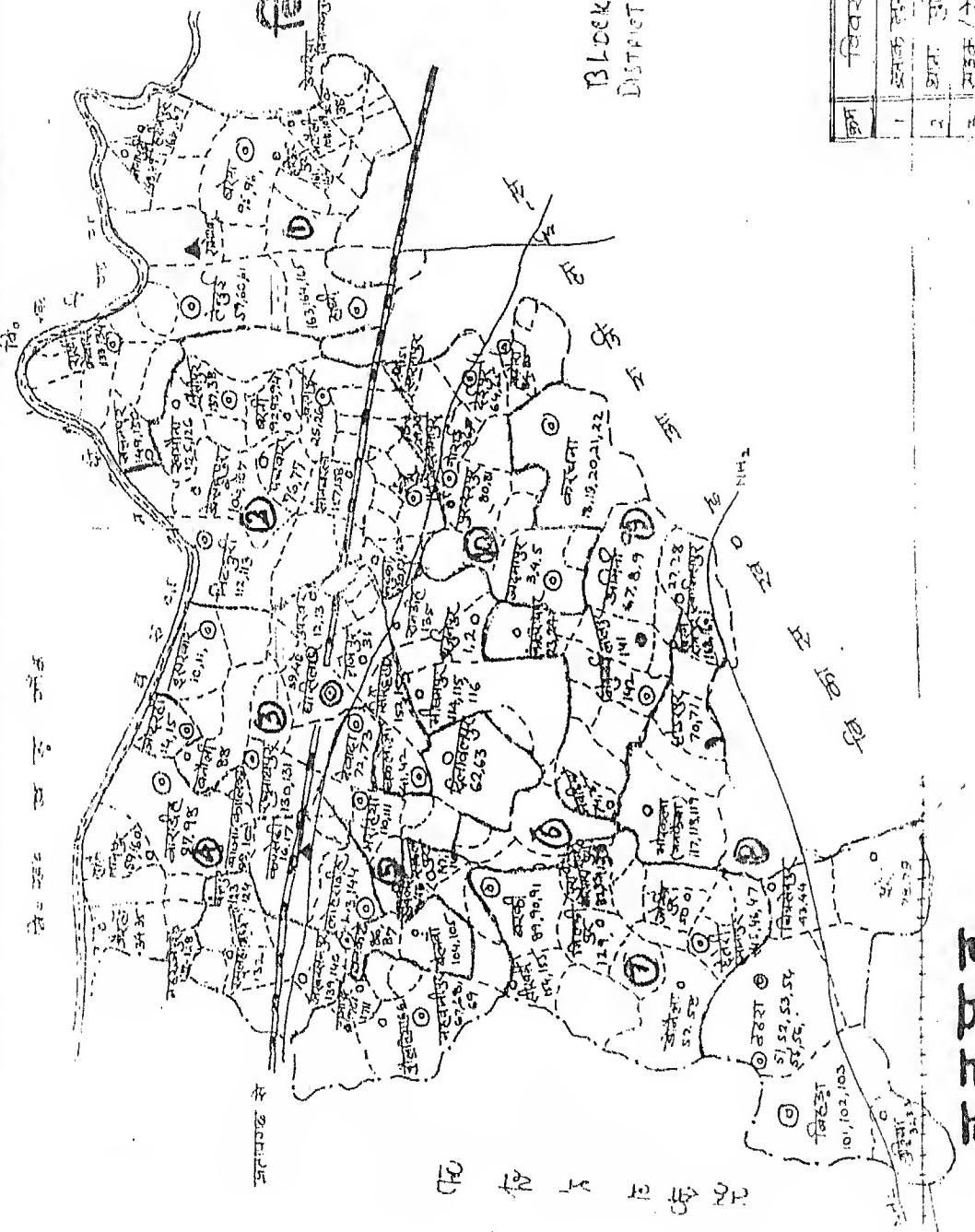
The above table acts as a ready reckoner to ascertain the maximum amount of capital investment, which should be made on the expectation of a given amount of surpluses of revenues over expenditures. As an example, if it is expected that a surplus of Rs.95000 can be generated in the initial year, then the investment will remain financially viable upto a maximum investment of $Rs.10.53 \times 95000 = Rs.10$ lakhs. An initial investment of an amount less than Rs.10 lakhs, which can generate a surplus of at least Rs.95000 in the initial year, is of course, a good investment proposition. The above result is true for a cost of capital 12% and the annual growth of surplus of revenues over expenditure @ 10% per annum. Other values given in the table are interpreted similarly.

**BADAURA RURAL MARKET
BLOCK SEVAPURI
DISTRICT VARANASI**

I. LOCATION OF THE BADAURA MARKET

Badaura rural market is the daily market. It is held on the sides of Banaras-Bhadohi road and Badaura – Deipur link road. This market is located at a distance of 24 kms. away from Vikas Bhawan, Varanasi. One has to travel towards Jausa on Bhadohi-Varanasi road. After Jausa, this market is located at 4 kms. on Bhadohi-Varanasi road. The market is being held on the road sides. Being on the road sides, market infrastructural facilities are non-existent. It is also not possible to develop such facilities at the present site. The Badaura Gram Panchayat, which claims its ownership over this market, does not collect any fee from the users of the market. However, Badaura Gram Panchayat is eager to develop this market at new site. It has already sent a proposal to the District Panchayati Raj Officer (DPRO), Varanasi in this regard. The hinterland of this market extends to large number of villages as could become evident from the discussion with the Badaura Gram Pradhan, sellers and buyers of this market and other acknowledgeable persons of this area. On this basis, the hinterland of market has been determined as follows:

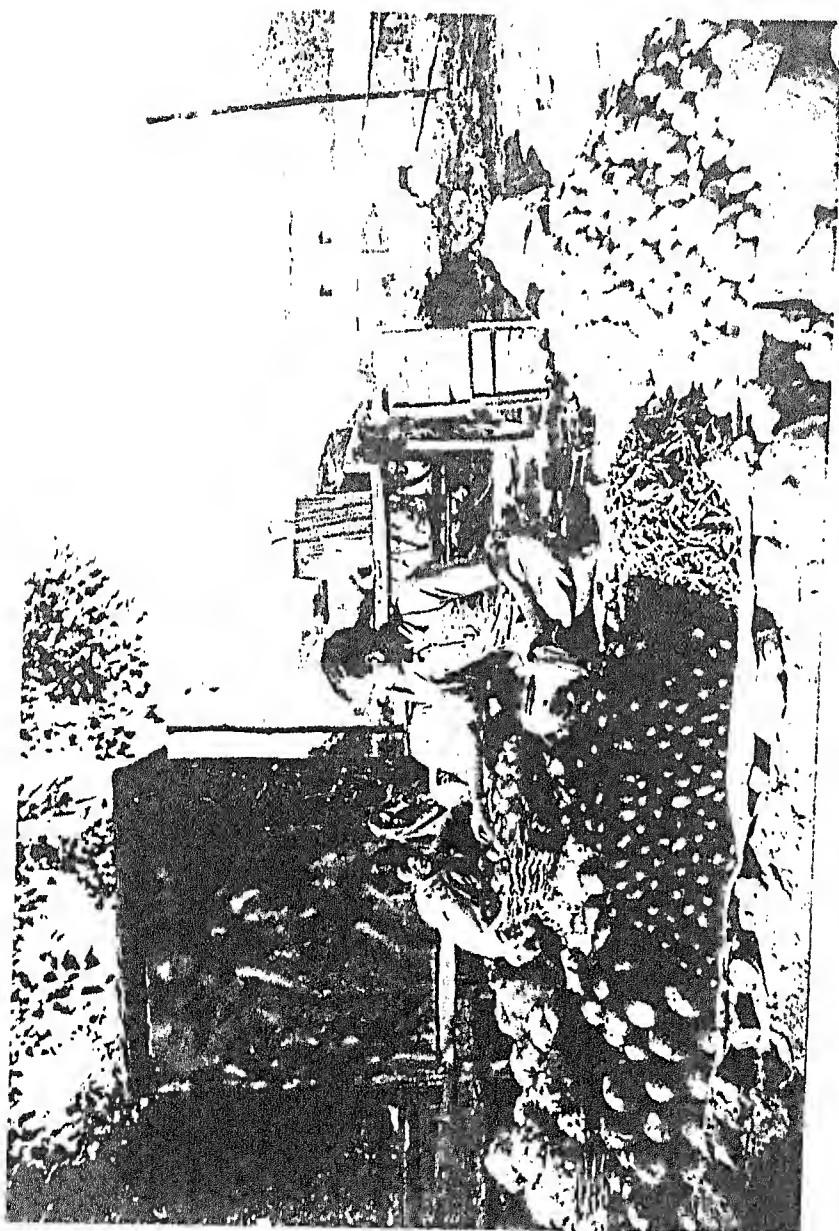
Name of the Village	Distance from the Market (in kms.)
1. Dasrathpur	2.50
2. Saharanpur	3.00
3. Jalalpur	2.00
4. Saurai	1.50
5. Purandarpur	1.50



BLOCK: SEWA PUP
DISTRICT: UJJAIN

क्रमांक	विवरण	दस्तक
१	इसके सम्बन्धित ग्राम	①
२	आगरा गुलस मोहन	●
३	सुकुम / रेखें लादन	—
४	सेवार	—
५	अधिकारीयाएं / संवेदनपत्र	③, ०

मानसहाय



A Trader Selling Vegetables In BADAU RA Market
in Varanasi.

6. Kardhama	3.00
7. Delpur	0.00
8. Badaura	0.00
9. Babapur	2.00
10. Tarsao	3.00
11. Bhadya	3.00
12. Saharpur	3.00
13. Jhabhra	1.50
14. Kamalpur	2.50
15. Singra	2.00
16. Heerapur	1.00
17. Sunarpur	2.00
18. Beduwa	1.00
19. Khargoopur	3.00
20. Adampur	3.00
21. Weerapur	1.00

II. STRUCTURE OF THE MARKET

The enumeration of shops in a market day by our research team revealed the fact there are 190 shops of different commodities. Out of the total shops, 73 per cent are of vegetables, 8 per cent of fruits, 5 per cent each of meat and fish and small eatables and

the remaining shops are of gur, masala, small agricultural implements and bangles. The complete structure of Badaura market has been shown in Table-1.

The table shows that out of total shops, 65 per cent are owned by the males and remaining 35 per cent by females. The 40 per cent shops of vegetables, 20 per cent of gur, 25 per cent of masala, 25 per cent of small eatables and 67 per cent of bangles are owned by the females. Among the total shops owned by females across different commodities, majority of them (91 per cent) sell vegetables.

Table-1 : Structure of the Badaura Market

COMMODITIES	TOTAL SHOPS			PERCENTAGE OF TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	90(60.00)	6(40.00)	150(100.00)	72.58	90.91	78.95
Gur	4(80.00)	1(20.00)	5(100.00)	3.23	1.52	2.63
Fruits	10(100.00)	--	10(100.00)	8.06	--	5.26
Masala	3(75.00)	1 (25.00)	4(100.00)	2.42	1.52	2.11
Meat, Fish	6 (100.00)	--	6(100.00)	4.84	--	3.16
Small eatables	7(75.00)	2(25.00)	8(100.00)	4.84	3.03	4.21
Small Agricultural Implements	4(100.00)	--	4(100.00)	3.23	--	2.11
Bangles	1(33.33)	2(66.67)	3(100.00)	0.81	3.03	1.58
Total	124(65.26)	66(34.74)	190(100.00)	100.00	100.00	100.00

Note : Figures in brackets indicate percentage.

Source: Based on field data.

III. SAMPLE OF THE MARKET

The sample selected for the study constitutes around 30 per cent. Across different commodities, 29 per cent of vegetable shops, 40 per cent of gur and 40 per cent of fruits shops were taken up for detailed study. Out of total shops owned by the males and females, 35 per cent and 21 per cent respectively were included in the sample as shown in Table 1.1.

In this way, in the sample the proportion of shops owned by the males and females are 73 per cent and 27 per cent respectively.

Table-1.1 : Sample of the Market

COMMODITIES	SELECTED SAMPLE SHOPS			PERCENTAGE OF SAMPLE SHOPS IN TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	30(69.77)	13(20.23)	43(100.00)	33.33	21.67	28.67
Gur	2 (100.00)	--	2 (100.00)	50.00	--	40.00
Fruits	4 (100.00)	--	4 (100.00)	40.00	--	40.00
Total	36(73.47)	13(26.53)	49(100.00)	34.62	21.31	29.70

Note : Figures in brackets indicate percentage.

Source: Based on field data.

IV. COMPOSITION OF THE MARKET

As evident from Table-2, the farmers and traders bring different commodities for sale in the market on any of the market day, i.e. Monday to Sunday (since the market is daily), it was estimated in enumeration that 56 per cent are farmers and 44 per cent are traders. Out of the total 150 sellers of vegetables, 70 per cent are farmers. In case of fruits shops, 20 per cent are of farmers. The remaining shops are of traders of different commodities.

On the basis of above, the Badaura market can be distinguished to have the following features:

1. It is the daily market
2. The Badaura market is mainly the market of local grown vegetables
3. It is the market of small local farmers as well as traders.

Table-2: Farmers and Traders Composition in the Badaura Market

Commodities	Farmers	Traders	Total
Vegetables	105(70.00)	45(30.00)	150(100.00)
Gur	--	5(100.00)	5(100.00)
Fruits	2(20.00)	8(80.00)	10(100.00)
Masala	--	4(100.00)	4(100.00)
Meat and Fish	--	6(100.00)	6(100.00)
Small eatables	--	8(100.00)	8(100.00)
Small agriculture implements	--	4(100.00)	4(100.00)
Bangles	--	3(100.00)	3(100.00)
Total	107(56.32)	83(43.68)	190 (100.00)

Source : Based on field data.

V. COMPOSITION OF THE SAMPLE

Keeping in view the composition of farmers and traders in selling of different commodities, more than half of the total farmers (63 per cent) and less than half of the total traders (37 per cent) have been included in the sample of study. In case of vegetables and fruits, 70 per cent and 25 per cent farmers are in the sample while the rest remain the sample traders as shown in Table-3.

Table-3: Farmers and Traders Composition in the Sample of Badaura Market

Commodities	Farmers	Traders	Total
Vegetables	30(69.77)	13 (30.23)	43 (100.00)
Gur	--	2(100.00)	2 (100.00)
Fruits	1(25.00)	3(75.00)	4(100.00)
Total	31(63.27)	18(36.73)	49 (100.00)

Source : Based on field data

VI. TURN OVER OF AGRICULTURAL PRODUCE IN BADAURA MARKET

The Badaura market is the daily market of mainly locally grown vegetables. It is evident that out of the total 190 shops, 150 shops sell small quantity of varied vegetables. Besides, taking into consideration of other agricultural commodities

like, gur and fruits, the number of shops increases to 165. The data collected from the sample shops showed that on an average 34 kgs. of vegetables are being sold by each vegetable shop followed by 8 kgs. of gur and 36 kgs. of fruits. On this basis, the total quantity sold by all shops per market day comes to 5144 kgs., 38 kgs., 363 kgs. and 5504 kgs. in respect of shops of vegetables, gur, fruits and all agricultural produce as evident in Table-4.

Table-4: Actual Turn Over of Agricultural Produce in Badaura Market

Commodities	No. of Shops in the Sample	Total Qty. Sold per Market Day by Sample Shops (Kg.)	Average Qty. sold per sample shop per market day (Kg.)	No. of Total shops in the market	Total Qty. sold by all shops per market day (Kg.)
Vegetables	43	1474.5	34.29	150	5143.50
Gur	2	15.0	7.50	5	37.50
Fruits	4	145.0	36.25	10	362.50
All Agricultural Produce	49	1634.5	33.36	165	5504.40

Source : Based on field data.

One of the conditions, as mentioned in the Terms of Reference (ToR) of UPDASP for the Feasibility Study of Rural Haat/Painth, 99 mentions that only those markets would be selected for the feasibility study, which have or expected to have within 4-5 years the annual turnover of more than 1000 MT of all

agricultural commodities. This pre-condition of market selection is justified in case of Badaura market because our estimate as shown in Table-5 indicates that this market has annual turnover of around 2009 MT of all agricultural produce at present. The annual turnover of vegetables has been estimated to be 1877 MT followed by 140 MT and 132 MT of gur and fruits respectively.

Table-5 : Annual Turn Over of All Agricultural Produce in the Badaura Market

Commodities	Turn Over (MT)
Vegetables	1877.38
Gur	13.59
Fruits	132.31
All Agricultural Produce	2009.11

Source : Based on field data.

VII. PERSONS INVOLVED IN BUYING AND SELLING

As per our enumeration, there are 190 shops of different commodities per market day in the Badaura market. In all the shops, more than one person is found to remain involved in selling. As far purchasing is concerned, the estimate comes that on an

average, 20 persons purchase from each shop per market day. Thus, a total 240 persons are estimated to be involved in selling and 3760 persons in purchasing of different commodities per market day. The maximum number of 192 and 3000 persons are estimated to remain involved in selling and buying of vegetables per market day. The commodity-wise number of persons estimated to be involved in buying and selling per market day in Badaura market has been shown in Table-6.

Table-6: Total and Average Number of Persons Involved in Selling and Buying Per Market Day in Badaura Market

Commodities	No. of Persons Involved in Selling	Average No. of Persons Involved in Selling	Total No. of Persons Involved in Buying	Average No. of Persons Involved in Buying	(No.)
Vegetables	192	1.28	3000	20	
Gur	5	1.00	50	10	
Fruits	10	1.00	188	19	
Masala	4	1.00	80	20	
Meat, Fish	8	1.33	120	15	
Small eatables	12	1.50	240	20	
Small Agricultural Implements	4	1.00	32	8	
Bangles	5	1.67	50	10	
Total	240	1.26	3760	20	

Source : Based on field data.

VIII. REVENUE POTENTIAL OF THE MARKET

The Badaura market is held daily and approximately 190 shops sell different commodities on each market day. However, no fee is levied on the sellers. It has been estimated by us that if minimum fee at the rate of Re.1/- per shop is imposed on each market day, approximately Rs.69350/- can be collected annually from the market as is evident from Table-7.

Table-7 : Present Potential of Market Fee in Badaura Market

Commodities	Total Shops	Potential Market Fee per Market Day (Rs.)	Potential Market Fee Per Annum (Rs.)
Vegetables	150	150	54750
Gur	5	5	1825
Fruits	10	10	3650
Masala	4	4	1460
Meat, Fish	6	6	2190
Small Eatables	8	8	2920
Small Agricultural Implements	4	4	1460
Bangles	3	3	1095
Total	190	190	69350

Source : Based on field data.

IX. MODE OF TRANSPORT USED

The farmers/traders bringing different commodities for sale in the market use three types of transport namely cycle, rickshaw trolleys, and bus/truck. It has been reported by the sample farmers/traders that around one-fourth of them also travel on foot to reach the market. In case of vegetables, which is the major commodity sold in the market around half of its seller bring it by cycle. The use of rickshaw trolleys has been reported by 14 per cent of vegetables and total sample farmers/traders. The sample farmers/traders have been classified according to the means of transport used by them to bring different commodities for sale in the market in Table-8.

Table-8: Farmers/raders Using Different Mode of Transport to Bring Agricultural Commodities

(No.)

Commodities	Cycle	On Foot	Bus/Truck	Rickshaw/ Trolleys	Total
Vegetables	21(48.84)	13 (30.23)	3 (6.98)	6 (13.95)	43 (100.00)
Gur	2(100.0)	--	--	--	2 (100.0)
Fruits	3(75.00)	--	--	1 (25.00)	4 (100.00)
Total	26(53.06)	13(26.53)	3(6.12)	7 (14.28)	49 (100.00)

Note : Figures given in brackets are percentage.

Source : Based on field data.

X. DISTANCE COVERED TO REACH THE MARKET

As observed earlier that Badaura market is important daily market of this area and its hinterland extends to its nearby villages. The farmers/traders come to this market by covering average distance of 1.48 kms. Around 51 per cent of total farmers/traders are found to be travelling the distance of less than 1 km. to reach this market as evident from Table-9.

The table shows that around 50 per cent farmers/traders of vegetables and gur cover the distance of less than 1 km. to come to this market whereas only 25 per cent farmers/traders selling fruits cover the same distance of less than 1 km. The average distance covered by the farmers/traders of fruits is also higher in comparison with the average distance covered by the sellers of vegetables and gur.

Table-9 : Classification of Sample Farmers/Traders According to the Distance Covered to reach the Badaura Market

Commodities	No. of Farmers/Traders			(No.)
	0-1 (km.)	1-3 (km.)	Total	
Vegetables	23(53.49)	20(46.50)	43 (100.00)	1.40
Gur	1 (50.00)	1(50.00)	2(100.00)	1.75
Fruits	1 (25.00)	3 (75.00)	4 (100.00)	2.25
Total	25 (51.02)	24(48.98)	49 (100.00)	1.48

Note : Figures in brackets indicate percentage.

Source: Based on field data.

XI. EXISTING FACILITIES IN THE MARKET

As observed in the market that vital infrastructural facilities are absent therein. This is so because the market is held on the both sides of the road. Only drinking water is available through hand pump. It also became evident that no facilities can be provided on the existing site of the market.

XII. NEED OF IMPROVED FACILITIES

As explained above, the Badaura market lacks vital infrastructural facilities. Therefore, utmost need is to be provided to improve facilities because all the sample farmers/traders have expressed their desire to have such facilities as evident from Table-10.

Table-10 : Need of Improved Marketing Facilities in Badaura Market

Commodities	Total No. of Farmers Shops	No. of Farmers Shops requiring improved facilities	No. of farmers willing to pay higher market fee	Total No. of Traders shops	No. of traders shops requiring improved facilities	No. of traders willing to pay higher market fee
Vegetables	30	30(100.00)	30(100.00)	13	13(100.00)	13(100.00)
Gur	--	--	--	2	2(100.00)	2 (100.00)
Fruits	1	1(100.00)	1(100.00)	3	3(100.00)	3(100.00)
Total	31	31	31	18	18	18

Note : Figures in brackets indicate percentage.

Source : Based on field data

It becomes evident that farmers/traders selling different commodities in the market need improved facilities and all of them are willing to pay higher market fee for using the improved facilities.

XIII. TYPE OF MARKETING FACILITIES REQUIRED

The farmers/traders of the market were enquired on the basis of PRA that what type of facilities they need. The PRA was applied more rigorously in case of female farmers/traders of the market. The views obtained from them have been presented in Table-11.

It reflects from the table that drinking water, shed, electricity, platforms, permanent shops and cycle stand are the main facilities needed by most of the sellers in market. The female farmers/traders want to have drinking water, toilet, electricity, platform and shed.

Table-11 : Type of Marketing Infrastructural Facilities Required by the Farmers/Traders of Badaura Market

Commodities	Total No. of Farmers/traders	Place	Dri-king Water	Shed	Road	Plat-form	Electri-city	Stor-age	Toilet	Perm-anent shop	Cycle stand	Proper drain-age
Vegetables	43	25 (58.14)	43 (100.0)	37 (86.05)	20 (48.51)	34 (79.07)	43 (100.0)	20 (46.51)	23 (53.49)	35 (81.40)	35 (81.40)	28 (65.12)
Male	30	20 (66.67)	30 (100.0)	28 (93.33)	15 (50.00)	22 (73.33)	30 (100.0)	18 (60.00)	10 (33.33)	25 (83.33)	30 (100.0)	20 (66.67)
Female	13	5 (38.46)	13 (100.0)	9 (69.23)	5 (38.46)	12 (92.31)	13 (100.0)	2 (15.38)	13 (100.0)	10 (76.92)	5 (38.46)	8 (61.54)
Gur	2	1 (50.00)	2 (100.0)	2 (100.0)	1 (50.00)	2 (100.0)	2 (100.0)	--	--	--	2 (100.0)	1 (50.00)
Male	2	1 (50.00)	2 (100.0)	2 (100.0)	1 (50.00)	2 (100.0)	2 (100.0)	--	--	--	2 (100.0)	1 (50.00)
Female	--	--	--	--	--	--	--	--	--	--	--	--
Fruits	4	2 (50.00)	4 (100.0)	2 (50.00)	1 (25.00)	1 (25.00)	4 (100.0)	1 (25.00)	1 (25.00)	1 (25.00)	4 (100.0)	2 (50.00)
Male	4	2 (50.00)	4 (100.0)	2 (50.00)	1 (25.00)	1 (25.00)	4 (100.0)	1 (25.00)	1 (25.00)	1 (25.00)	4 (100.0)	2 (50.00)
Female	--	--	--	--	--	--	--	--	--	--	--	--
Total	49	28 (57.14)	49 (100.0)	41 (83.67)	22 (44.90)	37 (75.51)	49 (100.0)	21 (42.86)	24 (42.86)	36 (73.47)	41 (83.67)	31 (63.27)
Male	36	23 (63.89)	38 (100.0)	32 (88.89)	17 (47.22)	25 (69.44)	36 (100.0)	19 (52.78)	19 (52.78)	26 (72.22)	36 (100.0)	23 (63.89)
Female	13	5 (38.46)	13 (100.0)	9 (69.23)	6 (38.46)	12 (92.31)	13 (100.0)	2 (15.38)	2 (15.38)	10 (76.92)	5 (38.46)	8 (61.54)

Note : Figures in brackets indicate percentage.

Source : Based on field data.

XV. EXPECTED INCREASE IN ARRIVALS AFTER MARKET IMPROVEMENT

The analysis carried above points out that (i) market infrastructural facilities are largely absent in the Badaura market and (ii) the farmers/traders of the market want to have facilities at new site proposed by the Badaura gram panchayat by paying market fee. It is being estimated by us that how much increase in arrival of agricultural commodities would result on account of provision of improved facilities in the market.

The analysis as carried in Table-12 shows that the arrival of agricultural commodities is expected to go up by around 91 per cent, that of vegetables by 86 per cent, 133 per cent of foodgrains and 137 per cent of fruits. The increase in arrivals will result on account of increase in present arrival and increase in arrival resulting from the new shops which will increase after the improvement of market.

Table-12: Expected Increase in Arrivals of Agricultural Produce After Market Improvement in the Badaura Market

Commodities	Vegetables	Gur	Fruits	All Agricultural Produce
Number of Sample Shops	43	2	4	49
Total Qty. expected to be sold by sample shops per market day (Kg.)	2394	25	245	2664
Average Qty. expected to be sold by sample shops per market day (kg.)	55.67	12.50	61.25	54.37
Total No. of Shops in the market	150	5	10	165
Total Qty. Expected to be sold per market day in existing shops (kg.)	8350.50	62.50	612.50	8971.05
Expected increase in number of new Shops	22	2	4	28
Expected turnover of new entrants (Kg.)	1224.74	25	245	1522.36
Total expected increase in turnover per market day (kg.)	9575.24	87.50	857.50	10493.41
Actual Qty. sold per market day (kg.)	5143.50	37.50	362.50	5504.40
Percentage Increase	86.16	133.33	136.55	90.64

Source : Based on field data.

XVI. EVALUATION OF ECONOMIC BENEFITS EMANATING FROM MARKET IMPROVEMENTS IN THE BADAURA MARKET

Apart from channelizing fresh agriculture produce from farm level to final consumers there are other economic benefits which are likely to be generated in the process of market improvements. In fact these benefits should be considered as an important factor and as a basis for taking up the task of Rural Market Improvement Programme. There are many economic benefits emanating from improved Rural Market infrastructure. These may broadly be grouped under following categories:

1. As an outcome of market improvements increased volume of trade results in comparatively lower or constant or higher per unit marketing cost.
2. Improved efficiency of market operations in the form of better product display, better facilities and availability of more marketing hours for the buyers and sellers result in higher per unit price of agricultural produce.
3. Reduction in spoilage of perishable crops; vegetables and fruits with the availability of improved rural marketing infrastructure.

It is very logical to put up the idea before a farmer/trader having shop in the market that for availing better market infrastructure they should bear higher market fee. For that matter, the shop owners (traders as well as farmers) have convincingly agreed to pay higher market fee for availing improved market facilities. Besides, additional market fee would also be realized from the new farmers/traders who would join the market after its improvement.

For this matter, it was calculated in the financial analysis (Table-16) that how much market fee is required to be collected after the improvement of market for the viability of market. It was found that for the viability of market, Rs.2/- per shop per market day is required to be collected. If this is taken as a basis of fee collection after the development of Badaura market, a total of Rs.436/- per market day is required to be collected as shown in Table-13.

Table-13 : Potential Market Fee and Increased Market Fee Expected to be paid by Farmers/Traders of Badaura Market

Commodities	No. of Sample Shops at Present	Present Potential of Market Fee of Total Shops (Per Market Day) (Rs.)	Expected Total No. of Shops after Market Improvement (No.)	Total increased market fee required for market improvement (Per Market Day) (Rs.)
Vegetables	150	150	172	344
Gur	5	5	7	14
Fruits	10	10	14	28
Masala	4	4	4	8
Meat and Fish	6	6	6	12
Small eatables	8	8	8	16
Small agricultural implements	4	4	4	8
Bangles	3	3	3	6
Total	190	190	218	436

Source : Based on field data

The table shows that the present fee potential of the market can be estimated to be Rs.190/- per market day on the basis of levying a minimum amount of Re.1/- per shop per market day. The expected increase in the number of shops is estimated to be 218 after market development and for viability, Rs.2/- per shop per market day is to be

XIV. EVALUATION OF ECONOMIC BENEFITS EMANATING FROM MARKET IMPROVEMENTS IN THE SAHANSA MARKET

Along with bringing fresh agricultural produce from farm level to final consumers or to collection centre, there are other economic benefits which are likely to accrue in the process of market improvements. In fact these benefits should be considered as an important factor to take up the task of rural market improvement programmes. There are many economic benefits emanating from improved rural market infrastructure. These may broadly be classified in following categories:

1. As a result of increased volume of trade owing to market improvements, the percentage increase in per unit cost of sale turns out to be far lower than percentage increase in market fee collection;
 2. Improved efficiency of market operations in the form of better product display, better facilities and availability of more marketing hours for the buyers and sellers resulting in higher per unit price of agricultural produce. Hence, providing remunerative prices to the farmers/traders;
 3. Reduction in spoilage of perishable crops, vegetables and fruits with the availability of improved rural marketing infrastructure.
- I. Since it is very logical to propose before farmers/traders having shops in the market for bearing higher market fee for availing better market infrastructure. The shop owners in the rural market of Sahansa have convincingly agreed to pay higher market fee to bear the cost of capital (Rs.9,00,000/-) for improved market infrastructural facilities. With the availability of improved infrastructural facilities some (80) new shops are expected to join the market and all of them will be paying enhanced market fee in Sahansa rural market.

Table 13 presents the detailed picture of required increased market fee collection for different market produce owing to expected market improvements. At present market fee collection from all shops per market day turns out to be Rs.240.00 in Sahansa market. As per our estimate around 80 new shops will be joining existing 120 shops due to improvement in market infrastructure. In this way, a total of 200 shops will exist here after market improvement. In order to recover the cost of capital for market improvement and infrastructural investment a sum of Rs.868.00 per market day will be required to be generated in this market. This much amount may be generated by collecting around Rs.4.50 per market day from each of the 200 shops as market fee. If we consider the hike in market fee per market day on an annual basis, the required increase in total revenue, i.e. Rs.868.00 can be multiplied by 156 days of a year on which market will be held, it comes around Rs.135408.00. Thus, the required annual increased market fee to meet the cost of capital for market improvement will be attained with this much hike in market fee collection from Sahansa market. Each of the existing farmer/trader is found to be convincingly agreeing with this proposal and market fee hike.

Table-13 : Actual Market Fee Paid and Increased Market Fee Expected to be paid by Sample Traders/Farmers of Sahansa Market

Commodity	Total No.of Shops at present	Present Potential of Market Fee (Per Market Day)	Expected Total No. of New Shops After Market Improvement	Total Increased Market Fee Required for Market Improvements (Per Market Day)
Vegetables	108	216	180	781.2
Gur	12	24	20	86.8
Total	120	240	200	868.0

Source : Based on field data

Despite hike in total market fee collection to the tune 117 per cent per unit cost of improved marketing facilities in case of both types of agricultural produces sold in the market remains only marginally higher as shown in Table-14.

Increased market fee would result in an overall 117 per cent increase in market fee collection. As compared to this, estimates have shown that increase in per unit cost of marketing is likely to remain 25 per cent to 33 per cent in case of both type of agricultural produces brought in the market for sale. Thus, provision of improved marketing facilities without significant increase in per unit cost of marketing in Sahansa market is a considerable economic benefit.

Table-14 : Change in Marketing Cost Before and After Market Improvement

Commodities	Present Market Turn Over of Sample Shops (Per Market Day) (Kg.)	Total Market Fee Collected Presently from Sample Shops (Per Market Day) (Rs.)	Expected Market Turn-over after market improvement in sample shops (Kg.)	Total Expected Collection as Market Fee from Sample Shops (Rs.)	Percentage Increase in Fee Collection after Market Improvement (Rs.)	% Increase in Per Unit Marketing Cost (Rs.)
Vegetables	2246	74(0.03)	3576	160.58(0.04)	117	33.33
Gur	85	10 (0.12)	140	21.70 (0.16)	117	33.33
Total	2331	84(0.04)	3718	182.28 (0.05)	117	25.00

Note : Figures in brackets show per unit of marketing.

Source : Based on field data

II. As a result of improved marketing facilities and infrastructure in the tri-weekly market of Sahansa farmers/traders are expected to maintain the quality of their produce to be sold in the market. In other words, they will be able to bring their produce in the market in a more presentable manner. Buyers will also feel more comfortable and confident while purchasing the produce under improved marketing conditions. In such conditions farmers/traders selling their produce will very easily be able to justify at least 5 per cent increase in the prices of their produce. As there will be no real increase or very nominal increase in per unit marketing cost, this hike in price would be a net gain to the farmers/traders selling their produce in the rural market of Sahansa.

Table 15 gives an example of net gain from 5 per cent hike in average prices of vegetable and gur on account of improved market efficiency in the rural market of Sahansa. These estimates are based on quantity and prices of vegetables and gur recorded from sample shop owners in Sahansa market. However, the estimates are approximate because the factor of seasonality has been ignored. It is evident from these figures that under this process the highest gainers are vegetable sellers followed by traders selling gur. Data presented in Table-15 shows that farmers/traders involved in the trading manage to gain a sum of Rs.378552.723 per annum with the introduction of market improvement in Sahansa market.

Table-15 : Estimation of Net Gain in Marketing Under Market Improvement

Commodities	Estimated Total Value of Commodities sold per market at present (Rs.)	Estimated value of commodities to be sold per market day after market improvements (at current prices) (Rs.)	Estimated Value of Commodities to be sold after market improvements 5% high prices (Rs.)	Net gain per market day (Rs.)	Net gain per annum (Approx.) (Rs.)
Vegetables	16389	43492.50	45667.12	2174.62	339240.72
Gur	1836	5040.00	5292.00	252.00	39312.00
Total	18225	48532.50	50959.12	2426.62	378552.72

Source : Based on field data.

Other indirect economic benefits are also involved in the process of efficient marketing system. A transparent and efficient system, as suggested for Sahansa market, will reduce the interference of middlemen and brokers in the determination of agriculture and other produce prices in the market. This will result in direct benefit to farmers/traders on account of increased prices. This gain may lead to expansion of agricultural activities resulting in higher production in the catchment area of Sahansa market.

III. Erection of marketing infrastructural facilities in Sahansa market may provide special benefit in the trading of perishable produce like vegetables, fruits, gur and meat.

In case of vegetables, fruits and meats, availability of facilities like water shed, light and storage may reduce at least 20 per cent spoilage of arrivals in the Sahansa market.

The proportion of vegetables in total market turn over in Sahansa market is expected to go higher with the availability of above listed infrastructural facilities.

With the availability of water shed and storage the spoilage rate under such conditions may go down to less than 20 per cent. In case of meat and fish marketing (which is presently prohibited inside market premise), the availability of better infrastructural facilities will reduce the spoilage of these produce to a considerable extent. Apart from this the hygienic conditions will also be maintained with the availability of these facilities in the market. Under the ordinary conditions the spoilage of fruits and meat products is 25 to 35 per cent and it could be reduced to 15 to 10 per cent with the availability of required infrastructural facilities in Sahansa market of Araji Nines block.

XVI. FINANCIAL AND ECONOMIC APPRAISAL OF INVESTMENT IN RURAL MARKET OF SAHANSA

Introduction

Rural markets are a hub-centre of socio-economic activities in a region. Along with public services such as Primary Health Centre, Veterinary Hospital, Post Office, Bank, Educational Institutions, Play Ground, PCO, Police Station, etc., they provide a fillip to the tempo of social, cultural and economic growth of the region comprising of a

number of villages from where buyers and sellers of goods and services are attracted to these markets.

Existing conditions in some such markets are far from satisfactory. A typical market may consist of some stalls of a temporary nature and sellers sit on ground and on chabutras of houses and shops, open to sky without any shed or cover. Quite often they are held once, twice or thrice a week during the afternoon hours. Some may be the daily markets.

The products traded in such markets include vegetables, fruits, edible oil, spices, jaggery, festival goods and services, foodgrains, meat, fish, ready made wears, chappals, sweets, chhats, general goods and services of cobblers, smiths, barbers, etc. Arrival of commodities in the market fluctuates, depending upon the season and other factors.

Catchment area of such rural markets comprises of a large number of smaller and big villages in the vicinity of the village where the market is held. Total catchment area of such markets may cover a distance of some 6-8 kms. comprising of 10-15 villages or even more.

The following are some of the important infrastructure and public utilities usually required in such markets:

- (1) Pucca open platforms
- (2) Shaded platforms
- (3) Pucca Shops
- (4) Space for Market Information Centre and Office for Market Management Committee

- (5) Room for Security Guard
- (6) Place for parking of cycles, scooters, buggies, horse-carts, tractor-trolleys, etc.
- (7) Storage facility
- (8) Electrification
- (9) Drainage facility
- (10) Boundary wall and Fencing around the haat area with the gates
- (11) Construction of Roads
- (12) Cattle Shed with drinking water facilities
- (13) Drinking wader
- (14) Toilets
- (15) Place for waste disposal
- (16) Plantation of trees

Management of the Market

Quite often the rural market is managed by the Gram Panchayat which realizes 'Tehbazari' from the traders. Another alternative arrangement is that the contract is awarded to a contractor for a stipulated amount per period and the contractor collects Tehbazari from the shopkeepers at predetermined rates. Gram Panchayat may form a "Market Management Committee" (MMC) to monitor the various activities of the market. The committee may take decisions on the mode of maintenance, management, rate of Tehbazari, method of its realization and settlement of disputes related to the market.

Construction of a market with covered and open pucca platforms, fencing around the area and facilities for storage, toilets, water supply, proper drainage and parking, etc.

can bring about an improvement in the conditions in such rural markets. Shopkeepers are willing to pay the 'Tehbazari' at higher rates provided proper facilities are developed.

Financial Analysis of Investment in Infrastructure

Initial investment is required on land and on capital cost involved in the creation of infrastructural facilities described above. Land for rural market could be the land owned by the Gram Panchayat, so that no investment is required to be made on this count.

Upkeep of the infrastructure is a must for the sustainability and trouble-free services. Below we provide estimates of expenditure (both capital and revenue type) required to be made in Sahansa market located in Araji Nines Block of Varanasi district, for which this feasibility study is being carried out (For details of the mathematical approach involved in this, see the Appendix given at the end).

XVII. FINANCIAL ANALYSIS OF PROPOSED INVESTMENT IN SAHANSA MARKET

Here we evaluate financial viability for providing facilities for the improvement of infrastructural facilities and other amenities in the rural market of Sahansa. Parameters involved in the financial analysis are detailed below:

1. Initial Capital Investment

Since the Sahansa market, at present, lacks infrastructural facilities therefore substantial amount will have to be spent on the modernisation of the market.

Platform/sheds need to be constructed, water supply is to be arranged and other infrastructural facilities are to be provided. All this would require capital expenditure. According to our estimate, Rs.9,00,000/- would be needed as initial capital, which will have to be spent over a time span of one year. This may be termed as initial capital investment. We also assume that the entire capital investment will be made instantaneously at the beginning of the year. This is not an unrealistic assumption.

2. Life Span of the Project

The market infrastructural facilities proposed to be provided in the Sahansa market would have usefulness for a fairly long period of time though depreciation is bound to take place with the passage of time. The actual life span of the project cannot be estimated with high degree of accuracy but on the basis of technical opinion of the Architect/Civil Engineer, it is assumed that the facilities proposed to be provided would last for a period of at least 15 years. It may not be unrealistic to assume that the facilities provided would remain useful even for a period of 20 years and above. In case of Sahansa market, we have taken the life span of the project to be 15 years. Thus, scrap value of the initial infrastructural facilities created at a cost of Rs.9,00,000 has been treated as 30% of the initial capital cost, i.e. Rs.2,70,000.

3. Cost of the Capital

Cost of the capital for project is a critical factor which determines the viability of project. Cost of capital based on the competitive interest rates prevailing in the market would be too high if considered for this market. For socially desirable activities, it is even

worthwhile to examine the financial viability at a relatively lower cost of capital. In practice also, the agencies involved in financing socially desirable activities encourage development of infrastructural facilities at a lower rate of capital cost. The projects so financed have plethora of social benefits, apart from financial benefits emanating from the project financed.

Keeping all this in view, 12 per cent annual cost of capital has been considered in the financial analysis of the Sahansa Market.

4. Cost of Repair and Maintenance

The proposed facilities to be provided in the market are bound to depreciate over the passage of time. Proper maintenance and upkeep of facilities in good condition is a social as well as economic necessity.

Keeping this objective in view, adequate provision has been made to account for the cost likely to arise on account of repair and maintenance. Items of expenditure under this head are as follows:

- (a) Expenditure on labour, materials and overheads for repair and maintenance of facilities;
- (b) Repair/Replacement of water pumps, electrical equipments and accessories etc. from time to time;
- (c) Salaries and wages payable to persons employed for the upkeep of facilities created by the project.

Details of annual maintenance expenditure are as follows:

1.	Watchman for Security @ Rs.1500 per month	Rs.18,000
2.	Sweeper for cleaning for 156 days @ Rs.40 per day	Rs. 6,240
3.	Electrical Maintenance for 156 days @ Rs.100 per day	Rs.15,600
4.	Maintenance of Handpump	Rs. 1,000
	Total	Rs.40,840

The above expenditure is expected to increase @ 5% annually.

Technical estimates suggest that there would be zero expenditure on repair and maintenance of the project during the first year. It is assumed that during second and third years, 2 per cent of the initial investment would be required for repair and maintenance. During the years 4 to 7, this will be 3% of the initial investment and thereafter @ 5 per cent of the initial capital investment will be needed for repair and maintenance of civil work and other infrastructural facilities till 15th year.

5. Revenues Arising from the Market

The completion of the market Improvement programme would result into substantial improvement in the working conditions of the Sahansa market. Farmers and traders would get a sizeable and respectable place to sit in and transact the business. They would be saved from the inconvenience arising due to limited space, open sale and bad weather. There is always a good-will value associated with a good looking shop.

As a result of improved facilities in the market it is expected that on account of availability of improved facilities the users of market would be willing to pay an increased market fee and rent for using these facilities.

Views of farmers/traders were solicited on the required increase in the market fee recoverable from them after market improvement programme is carried out. Incremental increase in revenue due to creation of infrastructural facilities has been put at Rs.1,35.400/- in the initial year. This is expected to go up @ 10% per annum.

NPV (Net Present Value) of Investments in the Projects

Based on the assumptions stated above, the sources of cash inflows and outflows are as follows:

Inflows

- (a) Expected increase in revenue (Beginning at Rs.1,35.400 per annum and going up @ 10% per annum)
- (b) Terminal value of initial investment (after 15 years from now) (30% of initial capital cost)

Outflows

- (c) Initial capital cost (Rs.9,00,000)
- (d) Cost of Repair and Maintenance (Rs.40,840 in the initial year and expected to increase @ 5% per annum)
- (e) Cost of maintenance of civil work and other infrastructural facilities (2% of capital cost in years 2 and 3, 3% in years 4 to 7, and 5% from years 8 onwards).

**Table 16: Computation of NPV and IRR on the basis of Expected Cash Flows
(Financial Point of View)**

Year	Addl Revenue Generated (based on increase @ 10% p a)	Terminal Value	Initial Capital Cost	Cost of Repair & Maintenance (based on increase @ 5% p a)	Rate of Increase in the Maintenance cost of civil work	Cost of Maintenance of Civil Work (based @ 2% of initial investment in years 2&3 and 5% thereafter)	Net Cash Flow
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
0			900000				(900000)
1							0
2	135400			40840	0.02	18000	76560
3	148940			42882	0.02	18000	88058
4	163834			45026	0.03	27000	91808
5	180217			47277	0.03	27000	105940
6	198239			49641	0.03	27000	121598
7	218063			52123	0.03	27000	138940
8	239869			54730	0.05	45000	140140
9	263856			57466	0.05	45000	161390
10	290242			60339	0.05	45000	184903
11	319266			63356	0.05	45000	210910
12	351193			66524	0.05	45000	239669
13	386312			69850	0.05	45000	271462
14	424943			73343	0.05	45000	306600
15	467438	270000		77010	0.05	45000	615428

NPV = 491; IRR = 12% per annum

Based on a cost of capita of 12%, the NPV of the project is Rs/491. However, with changes in the cost of capital the NPV of the project is as follows:

Table 17: Impact of Changes in Cost of Capital on Net Present Value

Cost of Capital	NPV (in Rs.)
0.06	608674
0.08	358756
0.10	159952
0.12	491
0.14	(128455)
0.15	(183637)
0.16	(233555)

Additional revenue arising due to the proposed investment on infrastructural facilities is required to be Rs.1,35,400 per annum in the initial year. However, if this falls short of the expectations, NPV becomes negative. In the tables below, the NPV and IRR are given for different amounts of additional revenue generated in the initial year ranging from Rs.130000 to as high as Rs.170000 along with the rates of growth in the revenues ranging from 5% per annum to 20% per annum.

Table 18 : Table Giving NPV at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)						
	130000	135500	140000	150000	160000	170000	
0.05	(360816)	(319084)	(284940)	(209064)	(133189)	(57313)	
0.06	(307639)	(263658)	(227673)	(147706)	(67740)	12227	
0.08	(189413)	(140430)	(100352)	(11292)	77769	166830	
0.10	(53258)	1488	46276	145811	245345	344879	
0.12	103690	165074	215298	326905	438512	550119	
0.14	284739	353783	410273	535807	661341	786875	
0.15	385472	458777	518754	652037	785319	918602	
0.20	1013620	1113501	119522	1376824	1558425	1740027	

Table 19 : Table Giving IRR at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)						
	130000	135500	140000	150000	160000	170000	
0.05	0.055	0.063	0.070	0.084	0.098	0.111	
0.06	0.067	0.075	0.082	0.096	0.109	0.122	
0.08	0.090	0.096	0.105	0.118	0.131	0.144	
0.10	0.112	0.120	0.126	0.140	0.152	0.164	
0.12	0.133	0.141	0.147	0.160	0.173	0.184	
0.14	0.154	0.161	0.167	0.180	0.192	0.204	
0.15	0.164	0.171	0.177	0.190	0.202	0.213	
0.20	0.211	0.218	0.224	0.236	0.248	0.260	

Accumulations in the Sinking Fund

Surpluses of revenues over expenditure can be used for further expansion of facilities in the market and for providing additional facilities to sellers and buyers. These funds can be invested in safe and profitable investment avenues with a view to get a lump sum amount of money which can be used for replacement of infrastructural facilities when they get decayed and outdated. The deposits in the fund are expected to be as follows, depending upon the rate of interest earned on investments:

Table 20: Table giving accumulated value of Deposits made in the Sinking Fund at Different Rates of Interest, as at the end of 15 years

Rate of Interest	Revenue of the Initial Year (Rs. in Lakh)					
	130000	135500	140000	150000	160000	170000
0.08	37.61	39.97	41.91	47.21	50.51	54.81
0.09	39.57	42.07	44.12	48.68	53.24	57.80
0.10	41.67	44.33	46.50	51.33	56.17	61.00
0.11	43.92	46.74	49.05	54.18	59.31	64.44
0.12	46.35	49.34	51.80	57.24	62.69	68.14
0.13	48.95	52.13	54.74	60.53	66.32	72.11
0.14	51.75	55.13	57.91	64.07	70.23	76.38
0.15	54.75	58.36	61.31	67.86	74.42	80.98

ECONOMIC ANALYSIS

The following intangible benefits of the investment are particularly noteworthy:

- (1) Increase in the value of transactions carried out in the market
- (2) Benefits for women
- (3) Technology dissemination and technology development

- (4) Reduction in spoilage
- (5) Dissemination of market intelligence
- (6) Encouragement in the trade of agricultural and horticultural produce

As is quite obvious, if we take into consideration the impact of the above mentioned intangible factors on the NPV or IRR of the project, then investment on infrastructure in a rural market becomes a highly profitable proposition. Detailed calculations incorporating various aspects of social cost benefit analysis have not been carried out.

We have considered in this study the financial dimensions of the project and have gathered information relating to financial viability. Ultimate success of the project would depend on how imaginatively the project is managed in all its aspects. In this regard, sound financial management is of great importance.

There are considerable moral and cultural benefits accruing from the investment. Such investment cannot be looked as an instrument merely for solving the problems of poverty and backwardness. The real contribution of the investment is in terms of enhancing the quality of life of the people in the region. The project would be advantageous from different view points.

Some such non-tangible benefits accruing from investment in the project are detailed below:

- (1) Markets are held under unhygienic conditions as at present. Food articles, vegetables are kept under exposed conditions and become carriers of diseases

and ailments. The project would create healthy and hygienic conditions and thereby the physical well being of the people would be improved.

- (2) Market is a place of social interaction. It is a venue where people belonging to the region converge for a day or two in a week and buy articles of daily consumption. Improved condition in the market enables people to buy good quality products and thus the quality of life would be improved.
- (3) Political and social reform activities are conducted through these markets. Improved conditions in the market would attract more and more people to come to the market and derive benefits.
- (4) Improved conditions in the market could lead to increased business activities and increased arrival of articles of consumption. More business transactions would be carried out through the market and consequently more employment as well as income generation opportunities would be opened up.
- (5) Consciousness about new products and technology, etc. would be spread through the market. This would lead to improvement in the living standards of people. Companies can launch new products and processes suited for local consumption through these markets.
- (6) Climatic conditions reach extreme level during summer, winter and rainy seasons. Conditions become extremely bad particularly during the rainy season and the arrivals of articles is adversely affected. During summer also, when temperature level reaches high, it becomes very difficult both for the traders as well as the customers to visit the market. During winter season also, chilly winds prevent

customers and traders to visit the market. Improved conditions would increase the number of days during which the markets are held.

- (7) When markets are not held regularly or when customers do not arrive in adequate numbers, agricultural produce particularly the perishable vegetables get spoiled or they have to be sold at low price resulting into loss for the producers as well as consumers. Poor and vulnerable sections of the society are particularly harmed on account of poor conditions in the market.
- (8) Improvement in the market would lead to increased economic activity in the region. It would lead to more efficient and effective utilization of the natural as well as man-power resources available in the region.
- (9) Cultural activities would be encouraged through improved working conditions. Social welfare and reform activities can also be carried out more easily by improving the conditions in the market.

In a nutshell, the conditions in the market indicate the level of development of civilization. The investment under consideration is a contribution towards civilizational development and thus carries within it several non-financial and non-economic benefits.

If these are taken into consideration, the true value of NPV and IRR is much higher than has been computed in the study. This is shown in the table below. Here we have added an amount equal to 10% of the incremental trading caused due to generation of infrastructural facilities in the market. Savings caused due to reduction in spoilage @ 2% of the additional trading have also been added.

Table 21 : Computation of NPV and IRR on the basis of Economic Analysis

Cash Flow on the basis of Financial Analysis	Benefits of Increase in Trading	Benefit due to Reduction in Spoilage	Total Cash Flow
76560	37855	7571	121986
88058	39748	7950	135756
91808	41735	8347	141890
105940	43822	8764	158527
121598	46013	9203	176814
138940	48314	9663	196916
140140	50730	10146	201015
161390	53266	10653	225310
184903	55927	11186	252018
210910	58726	11745	281281
239669	61662	12332	313663
271462	64745	12949	349156
306600	67983	13597	388180
615428	71382	14276	701086
NPV = 345165; IRR = 16.553%			

WORDS OF CAUTION

Financial viability of the project depends primarily on :

- (1) Surplus of Revenue over expenses (Net Cash Flow); and
- (2) The cost of capital.

In the table-22 given below, we have calculated the requirements of net cash flow based on different life spans of the project ranging between 15 to 40 years and on the basis of cost of capital ranging between 5% to 18% per annum for an initial investment of Rs.9 lakh on the infrastructural facilities in the market. The results are quite revealing in the sense that if the market fails to generate a minimum revenue as given in the table, the investment would not be financially viable proposition.

Table 22 : Table Giving Equivalent Annual Cost for Different Life Span of the Project at Different Costs of Capital

Cost of Capital (k)	Life of Project (n) (in Years)						
	15	20	25	30	35	40	
0.05	86708	72218	63857	58546	54965	52450	
0.06	92666	78466	70404	65384	62076	59815	
0.08	105147	91667	84311	79945	77223	75474	
0.10	118326	105714	99151	95471	93321	92033	
0.12	132142	120491	114750	111729	110085	109173	
0.15	153915	143785	139229	137070	136021	135506	
0.16	161422	151800	147611	145697	144803	144381	
0.18	176763	168138	164627	163136	162495	162216	

APPENDIXMATHEMATICAL APPROACH INVOLVED IN THE APPRAISAL OF
INVESTMENT ON INFRASTRUCTURE IN A RURAL MARKET

Let the initial investment on the development of infrastructural and public utilities in a market be Rs. 1. It takes about one year to complete the construction of the facilities and these are available for use after a period of one year since construction commences. It is assumed that incremental expenditure on maintenance of the facilities is incurred all at the end of every year and commences from the end of 2 years since construction starts. This same logic holds for incremental revenues also. The gap between incremental revenues and incremental expenditures (i.e. surplus of revenues over expenditures) is assumed to be Rs.X in the beginning (i.e. at the end of 2 years since construction etc. starts) and this increases in real term, @ g per annum. Useful life span of the initial investment is taken to be 14 years with an assumed depreciation @ 5% per annum simple, so that the terminal value of the infrastructural facilities created in the first year would remain to be 30% of the initial investment 1. Cost of capital is assumed to be 'k' per annum.

Based on the above logic,

$$I = \frac{X}{(1+k)(g-k)} \left[\frac{(1+g)^{14} - 1}{(1+k)^{15}} \right] X, \text{ and}$$

$$\left[(1+k)^{15} - 0.30 \right]$$

$$X = \frac{[(1+k)^{15} - 0.30] (1+k)(g-k)}{[(1+k)^{15} \left[\frac{(1+g)^{14}}{(1+k)^{14}} - 1 \right]]} I$$

If k and g are assumed to be 12% and 10% respectively, the above expression becomes

$$I = 10.53 \cdot X \cdot (Bx), \text{ or equivalently}$$

$$X = 0.095 \cdot I \cdot (C.I)$$

If cost of capital (k) ranges between 6% to 15% and the growth in surplus (g) ranges between 5% to 20%, the following matrix giving the values of the coefficients involved in the above expression $X = .095 \cdot I$ is generated.

Table 23: Table giving the values of 'C' in the expression $X = C \cdot I$. at different rates of cost of capital and rates of growth

g = rate of growth in surplus of revenues over expenditures	k = Cost of capital					
	0.0600	0.0800	0.1000	0.1200	0.1400	0.1500
0.0500	0.0746	0.0900	0.1067	0.1246	0.1437	0.1538
0.0600	NA	0.0849	0.1009	0.1182	0.1367	0.1465
0.0800	0.0620	NA	0.0901	0.1061	0.1234	0.1326
0.1000	0.0546	0.0668	NA	0.0950	0.1110	0.1195
0.1200	0.0479	0.0589	0.0712	NA	0.0995	0.1074
0.1400	0.0419	0.0518	0.0629	0.0753	NA	0.0962
0.1500	0.0392	0.0486	0.0591	0.0709	0.0840	NA
0.2000	0.0277	0.0348	0.0429	0.0520	0.0624	0.0680

(X = Surplus of revenue over expenditure required to be generated at the end of year 2, I = Initial capital outlay, C = Coefficient values computed on the basis of the assumptions stated in the model)

The above table acts as a ready reckoner to ascertain the amount of surplus of revenues over expenditures required to be generated on annual basis with a constant annual growth rate of 'g' and a given cost of capital 'k' in order to justify (on the grounds of financial viability) the initial investment of Rs.1 in a market. As an example, if initial capital outlay on a market is Rs.10 lakhs, then $.095 \times \text{Rs.}1000000 = \text{Rs.}95000$ is the annual surplus of revenues over expenditures which is required to be generated at the end of the initial year (i.e. year 2) in which facilities are made available for use. This should grow annually @ 10% per annum ($g=.10$) in order to make the project viable from financial point of view.

Reciprocals of the values given in the table 21 above, gives the values of B in the expression $I = BX$. Results are as follows:

Table 24: Table giving the values of 'B' in the expression $I = BX$ at different rates of cost of capital and rates of growth

	$k = \text{Cost of capital}$						
	0.06	0.08	0.10	0.12	0.14	0.15	
$g = \text{rate of growth in surplus of revenues over expenditure}$	0.05	13.40	11.11	9.38	8.03	6.96	6.50
	0.06	NA	11.77	9.91	8.46	7.31	6.83
	0.08	16.13	NA	11.09	9.42	8.10	7.54
	0.10	18.32	14.98	NA	10.53	9.01	8.37
	0.12	20.88	16.97	14.05	NA	10.05	9.31
	0.14	23.85	19.29	15.89	13.28	NA	10.39
	0.15	25.52	20.58	16.91	14.10	11.91	NA
	0.20	36.04	28.73	23.32	19.21	16.03	14.71

The above table acts as a ready reckoner to ascertain the maximum amount of capital investment, which should be made on the expectation of a given amount of surpluses of revenues over expenditures. As an example, if it is expected that a surplus of Rs.95000 can be generated in the initial year, then the investment will remain financially viable upto a maximum investment of $Rs.10.53 \times 95000 = Rs.10$ lakhs. An initial investment of an amount less than Rs.10 lakhs, which can generate a surplus of at least Rs.95000 in the initial year, is of course, a good investment proposition. The above result is true for a cost of capital 12% and the annual growth of surplus of revenues over expenditure @ 10% per annum. Other values given in the table are interpreted similarly.

**BARAGAON RURAL MARKET
BLOCK BARAGAON
DISTRICT VARANASI**

II. LOCATION OF THE BARAGAON MARKET

Baragaon is a daily rural market held at Baragaon village located in Baragaon block of district Varanasi. The market is located approximately 26 kms. from district headquarter. To reach the market, one has to travel about 20 kms. on Varanasi-Babatpur road and then about 6 kms. more on Babatpur-Bhadohi road. The market of Baragaon, being primarily a wholesale market of vegetables, is not very old. It is held on the side of PWD road. However, some three-four private tin sheds-cum-godowns are also available for farmers/traders to keep their vegetables like potato, onion, etc. during off the marketing hours of the day.

The revenue collection from farmers/traders is being taken by private individuals who are involved in the wholesale trading business and providing their private tin shed and godowns to farmers/traders in Baragaon rural wholesale market. Thus, the existing market location being on the road side, any kind of improvement for better market infrastructural facilities is very difficult. The change in its location is required on gram panchayat land to provide better infrastructural facilities to farmers/traders involved in the sale of their produce and to channelize revenue, collected in the form of market fee, for market improvement through gram panchayat.

The detailed location of the existing market and alternative site owned by gram panchayat have been indicated in the enclosed map. The hinterland of Baragaon rural market is quite large, which consists of following 31 villages:

Name of the Village	Distance from the Market (kms.)
1. Baragaon	0.00
2. Fatteypur	1.50
3. Karampur	1.00
4. Koori	5.00
5. Sattanpur	2.00
6. Chilbila	5.00
7. Kumbhapur	6.00
8. Shervanipur	9.00
9. Bowlia	9.00
10. Kushmura	1.00
11. Khushialipur	1.00
12. Ishipur 2.00	
13. Gopalpur	4.00
14. Girdhavalpur	2.00
15. Pachrasi	1.50
16. Ramsinghpur	1.00
17. Bharatpur	1.00
18. Kushahi	1.00
19. Kavurampur	1.00
20. Khataura	1.50
21. Devachanpur	4.00
22. Bagia	3.00
23. Natwa	3.00
24. Dadwa 2.50	
25. Kharawan	5.00
26. Chek Kharawan	5.00
27. Adiyarpur	6.00
28. Sadhavganj	7.00
29. Anary	9.00
30. Bheti	8.00
31. Kaniyar	3.00

II. STRUCTURE OF THE MARKET

The field visit to the market for data collection and in-depth discussion with the Baragaon village pradhan, Block Pramukh and other knowledgeable persons of this area revealed that the structure of Baragaon rural market consists of about 169 shops of farmers/traders in any normal market day. Among the total shops of different commodities, vegetables shops are largest (150), followed by fruits shops (8), small eatables and miscellaneous of other eatables (8) and betel shops (3).

Out of total shops in the market, 10.06 per cent are owned by female farmers/traders. The shops dealing in the sale of vegetables and fruits in the market are found to be owned by 15 per cent and 25 per cent females respectively. In none of the other shop categories any shop is owned by female farmers/traders in Baragaon market. The commodity-wise total number of shops owned by male and female with their respective percentage share are shown in Table-1. The sample selection for the study constitutes more than 33 per cent as shown in Table 1.1.

Table-1 : Structure of the Baragaon Market

COMMODITIES	TOTAL SHOPS			PERCENTAGE OF TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	135(90.00)	15(10.00)	150(100.00)	88.82	88.24	88.76
Fruits	6(75.00)	2(25.00)	8(100.00)	3.95	11.65	4.73
Small Eatables	4(100.00)	--	4(100.00)	2.63	--	2.37
Tea shops	4(100.00)	--	4(100.00)	2.63	--	2.37
Betel Shops	3(100.00)	--	3(100.00)	1.97	--	1.76
Total	152(89.94)	17(10.06)	169(100.00)	100.00	100.00	100.0

Note : Figures in brackets indicate percentage.

Source: Based on field data.

विष्णु - बडागाँव

BLOCK : BAPANGADA
DISTRICT : VARANASI



प्राप्ति	प्रकार	विवरण	उपलब्ध
१	पुलिस दोक्टर	सेक्युरिटी एवं रेस्क्यु लाइन	○/△
२	पुलिस दोक्टर	सेक्युरिटी / रेस्क्यु लाइन	—/—
३	पुलिस दोक्टर	सेक्युरिटी एवं रेस्क्यु लाइन	—/—
४	पुलिस दोक्टर	सेक्युरिटी / रेस्क्यु लाइन	○/○

Table-1.1 : Sample of the Market

COMMODITIES	SELECTED SAMPLE SHOPS			PERCENTAGE OF SAMPLE SHOPS IN TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	43(87.76)	6(12.24)	49(100.00)	31.86	40.00	32.67
Fruits	3(75.00)	1(25.00)	4(100.00)	50.00	50.00	50.00
Total	46(84.91)	7(13.21)	53(100.00)	32.62	41.18	33.54

Note : Figures in brackets indicate percentage.

Source: Based on field data.

III. COMPOSITION OF THE MARKET

As shown in Table-2, the farmers and traders bring vegetables and fruits for sale in rural market for Baragaon. In each market days it is found that among all the sellers of vegetables and fruits, more than 78 per cent are the farmers and less than 22 per cent are the traders. In the group of vegetables shops 80 per cent belong to farmers and rest of 20 per cent to traders. But in case of fruits 50 per cent shops belong to farmers and rest 50 per cent to the traders in Baragaon market. Thus, in case of vegetables, which are the main arrival of this market, these are sold mainly by farmers located in the hinterland of the market. The phenomenon is indicative of the fact that Baragaon rural market has four distinctive features.

- (i) Baragaon rural market is local agricultural based daily market.
- (ii) This is primarily a market of potato and cauliflower;

- (iii) The market of Baragaon is a wholesale vegetable market and serves as main collection centre of this area
- (iv) Majority of market activities are run by local farmers.

Table-2: Farmers and Traders Composition in the Baragaon Market

Commodities	Farmers	Traders	Total
Vegetables	120(80.00)	30(20.00)	150 (100.00)
Fruits	04(50.00)	4(50.00)	08(100.00)
Total	124(78.48)	34(21.52)	158(100.00)

Source : Based on field data.

IV. COMPOSITION OF THE SAMPLE

Considering the existing share of total farmers and traders in selling of vegetables and fruits in Baragaon rural market, the sample covers 81.13 per cent farmers and 18.87 per cent traders in the sample of study. In case of vegetables sample constitutes 81.63 per cent farmers and remaining 18.37 per cent traders. In the group of fruits sample covers 75 per cent farmers and rest of the 25 per cent traders. A total of 53 shops constituting more than 31 per cent of total existing shops of the market are taken in study sample as shown in Table-3.

Table-3: Farmers and Traders Composition in the Sample of Baragaon Market

Commodities	Farmers	Traders	Total
Vegetables	40(81.63)	9(18.37)	49(100.00)
Fruits	03(75.00)	1(25.00)	04(100.00)
Total	43(81.13)	10(18.87)	53(100.00)

Source : Based on field data

V. TURN OVER OF AGRICULTURAL PRODUCE IN BARAGAON MARKET

The structure of Baragaon rural market indicates that this is primarily a market of vegetables produced in the villages of market hinterland. The structure further indicates that out of total 158 shops dealing in agricultural commodities 150 are engaged in the sale of vegetables only. The vegetables command major share followed by fruits. Data collected from sample shops showed that on an average 64 kgs. of vegetables were sold by each vegetables shop followed by more than 31 kgs. fruits per fruit shop. On the basis of this, the total quantity sold by all the shops per market day comes to 9900 kgs. and 250 kgs. in case of vegetables and fruits respectively. Thus, the average quantity of vegetables and fruits sold per market day is found to be 10014 kgs. in the wholesale market of Baragaon as is evident from Table-4.

Table-4: Actual Turn Over of Agricultural Produce in Baragaon Market

Commodities	No. of Shops in the Sample	Total Qty. Sold per Market Day by Sample Shops (Kg.)	Average Qty. sold per sample shop per market day (Kg.)	No. of Total shops in the market	Total Qty. sold by all shops per market day (Kg.)
Vegetables	49	3234	66.00	150	9900.00
Fruits	04	125	31.25	08	250.00
All Agricultural Produce	53	3359	63.38	158	10014.04

Source : Based on field data

One of the criterions of selection of rural haat/painth for feasibility study is that while selecting the market it should be ensured that either market turnover is more than 1000 MT per annum of all agricultural commodities or market has the potential to attain this target in coming days. The first part of this pre-condition of market selection is justified in case of Baragaon rural market because our estimates as shown in Table-5 based on primary data collected from sample farmers/traders selling their produce in this market indicated that this market has annual turnover of around 3705 MT of vegetables and fruits. The annual turnover of vegetables has been estimated to be 3613.50 MT followed by 91.25 MT of foodgrains as shown in Table-5.

Table-5 : Annual Turn Over of All Agricultural Produce in the Baragaon Market

Commodities	Turn Over (MT)
Vegetables	3613.50
Fruits	91.25
All Agricultural Produce	3704.75

Source : Based on field data

VI. PERSONS INVOLVED IN BUYING AND SELLING

As per our observation and data collection, there are 169 shops of different commodities per market day in Baragaon rural market. The average number of persons estimated to be engaged in selling is found to be more or less same (around one to two persons) in case of agricultural commodities and in the sale of non-agricultural items as shown in Table-6. It is further revealed through Table-6 that on an average 17 persons purchase from each shop of the market in a single market day. In case of vegetables and fruits average involvement of buyers per shop turns out to be 15 persons in each of the produce category. At the same time in case of non-agricultural commodities, higher number of persons made purchases from each shop. In total, 2800 persons are estimated to be involved in buying and selling of different commodities per market day. It further indicates, on account of multiple buying, a total number of around 2000 persons

are estimated to be involved in purchase of different commodities per market day in Baragaon market. Apart from this, about 190 persons are found to be engaged in selling of their produce in the market. Thus, total of around 2000 to 2200 persons are estimated to be present in a normal market day in the Baragaon rural market.

Table-6: Total and Average Number of Persons Involved in Selling and Buying Per Market Day in Baragaon Market

Commodities	No. of Persons Involved in Selling	Average No. of Persons Involved in Selling	Total No. of Persons Involved in Buying	Average No. of Persons Involved in Buying (No.)
Vegetables	168	1.12	2250	15.00
Fruits	8	1.00	120	15.00
Small Eatables	6	1.50	180	45.00
Tea shops	5	1.25	160	40.00
Betel shops	3	1.00	90	30.00
Total	190	1.12	2800	16.57

Source : Based on field data.

VII. MARKET FEE, REVENUE OBTAINED AND ITS POTENTIAL

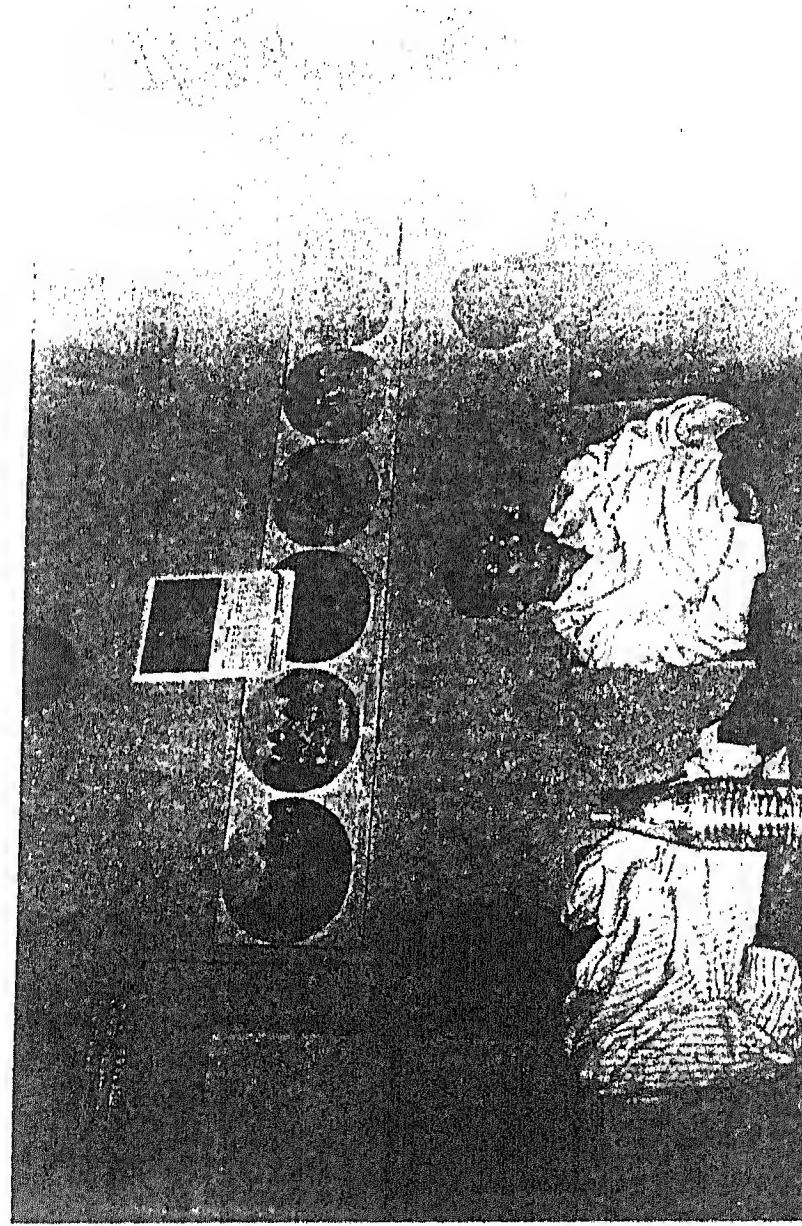
In course of detailed interview with different functionaries of Baragaon rural market, it is recorded that sellers pay Rs.22.50 to Rs.10 per shop per market day to

private contractor of the Baragaon market. The Gram Panchayat of Baragaon is not collecting any market fee from the farmers/traders selling their produce in this market. In this way a total average sum of Rs.3681 is collected per market day from Baragaon rural market. On the basis of existing market fee collection from each shop of the market, a sum of Rs.1343565/- is being collected per annum. Out of total collection, more than 92 per cent amount of market fee is being collected from farmers/traders selling vegetables in this market. Rest of the 8 per cent fee is collected from farmers/traders engaged in the sale of fruits and other eatables. In this way, total existing market fee from the Baragaon rural market is being collected by private contractors of the market. From the point of view of Gram Panchayat's earnings this may be deemed as potential market fee which can be collected after shifting the venue of present market of Baragaon at the proposed place (Table-7).

Table-7 : Present Potential of Market Fee in Baragaon Market

Commodities	Total Shops (No.)	Rate of Market Fee at Present (Rs.)	Actual Market Fee Per Market Day (Rs.)	Potential Market Fee Per Annum (Rs.)
Vegetables	150	22.50	3375	1231875
Fruits	8	22.00	175	64240
Small Eatables	4	15.00	60	21900
Tea Shops	4	10.00	40	14600
Betel shops	3	10.00	30	10950
Total	169	21.78	3681	1343565

Source : Based on field data.



Members of Study Team in The
Dive Center of Diving Institute

VIII. MODE OF TRANSPORT USED

For bringing the agricultural produce for sale in Baragaon rural market the farmers/traders are found to be using tractors, rickshaw and cycle as mode of transport. The most used mode of transport for agricultural produces is found to be cycle. Table-8 indicates that more than 66 per cent farmers/traders used cycle for transporting their produce in Baragaon rural market. The second most adopted transport mode is rickshaw trolley in this market. About 19 per cent farmers/traders are using rickshaw for transporting their product. Apart from these two modes, tractor trolley is also being used for the same by more than 15 per cent farmers/traders in Baragaon market. In fact Baragaon being a wholesale market, the use of tractor becomes viable and saves a lot of time for bringing vegetables in the market.

In case of vegetables all the three modes of transport, i.e. cycle, rickshaw and tractors are being used by 63.27 per cent, 20.40 per cent and 16.33 per cent farmers/traders respectively to bring their produce in the market. But for transporting fruits in the Baragaon market only cycle has been used as mode of transport by all the farmers/traders of this market.

Table-8: Traders Using Different Mode of Transport to Bring Agricultural Commodities

Commodities	Rickshaw Trolleys	Tractor Trolleys	Cycle	(No.) Total
Vegetables	10(20.41)	8(16.33)	31(63.27)	49(100.00)
Fruits	--	--	4(100.00)	4 (100.00)
Total	10(18.87)	8(15.09)	35(66.04)	53 (100.00)

Note : Figures given in brackets are percentage.
Source : Based on field data.

IX. DISTANCE COVERED TO REACH THE MARKET

The rural market of Baragaon is an important wholesale daily market of Baragaon area. Its hinterland extends to around 31 villages. All these villages are found to be located within 9 kms. from Baragaon market. However, maximum number of villages (30.19 per cent of the total villages) are located at the distance of 3 to 5 kms. from the place of the market. Other 24.53 per cent villages are within the radius of 1 km. from market place. Some 11.32 per cent villages are located at the distance of 5 to 7 kms. Remaining 6 sample villages (constituting 11.32 per cent of total villages) are located at the furtherest distance of 7 to 9 kms. from Baragaon rural market. On an average farmers/traders cover around 4 kms. to reach the market.

In case of vegetable farmers/traders 12.24 per cent cover a maximum distance of 7 to 9 kms. to reach the market. The maximum distance of 5 to 7 kms. is covered by 25 per cent farmers/traders dealing in the sale of fruits. All these characteristics point to the fact that Baragaon market is an important trading centre for the people residing in sizeable large area. Hence, its improvement is going to benefit large number of villages. In Table-9, classification of sample farmers/traders has been made in accordance with the commodities sold by them and distance covered .

Table-9 : Classification of Sample Farmers/Traders According to the Distance Covered to reach the Baragaon Market

Commodities	Distance Covered Area						(No.) Average Distance Covered
	0-1 (km.)	1-3 (kms.)	3-5 (kms.)	5-7 (kms.)	7-9 (kms.)	Total	
Vegetables	12 (24.49)	8 (16.33)	4 (28.57)	9 (18.37)	6 (12.24)	49 (100.0)	4.10
Fruits	1 (25.00)	--	2 (50.00)	1 (25.00)	--	4 (100.0)	4.25
Total	13 (24.53)	8 (15.09)	16 (30.19)	10 (18.87)	6 (11.32)	53 (100.0)	4.11

Note : Figures in brackets indicate percentage.

Source: Based on field data.

X. NEED OF IMPROVED FACILITIES

It is drawn from on the spot observation and informations of Baragaon rural market available so far that there is an immense scope and need for making available marketing infrastructural facilities. Therefore, utmost need is to provide improved facilities because all the sample farmers and traders have expressed their desire to have such facilities as shown in Table-10. It becomes obvious that farmers/traders selling different commodities in the market need improved facilities and all of them are willing to pay marginally higher market fee for using the improved market infrastructural facilities. Here in case of Baragaon rural market the fact remains that existing market fee is found to be sufficient to afford market improvement provided market fee is collected through Gram Panchayat.

Table-10 : Need of Improved Marketing Facilities in Baragaon Market

Commodities	Total No. of Farmers Shop	No. of Farmers Shops requiring improved facilities	No. of farmers willing to pay higher market fee	Total No. of Traders shop	No. of traders shop requiring improved facilities	No. of traders willing to pay higher market fee
Vegetables	40	40(100.00)	40(100.00)	9	9(100.00)	9(100.00)
Fruits	3	3(100.00)	3(100.00)	1	1(100.00)	1 (100.00)
Total	43	43	43	10	10	10

Note : Figures in brackets indicate percentage.

Source : Based on field data

XI. TYPE OF MARKETING FACILITIES REQUIRED

As it is seen that infrastructural facilities are largely lacking in Baragaon market, the farmers/traders who bring different agricultural produce for sale in this market were interviewed and encouraged to respond on the basis of PRA by innumerators of the study team regarding type of infrastructural facilities they require. The farmers/traders who responded to the questions of the study team are presented in Table-11. It is evident from information presented in the table that all farmers/traders are in need of the facilities like drinking water and electricity. Toilet, proper drainage system, permanent shops, platform, proper place for selling, shed, road, cycle stand and storage facility are some other important facilities reported to be required by 44 per cent to more than 92 per cent of existing farmers/traders dealing in the market of Baragaon.

Giving their view on type of infrastructural facilities required, all female farmers/traders coming in this market have reported requirement for proper drainage, toilets, drinking water and electricity. The second important type of facilities for them are found out to be the roads, proper place for sitting, permanent shops and tin sheds. These facilities are reported to be required by 86 per cent to 92 per cent of female farmers/traders coming in this market. Some other facilities like platform and storage are also demanded by sizeable number of female farmers/traders of this market as is evident from table-11.

Table-11 : Type of Marketing Infrastructural Facilities Required by the Farmers/Traders of Baragaon Market

Commodities	Total No. of Farmers/traders	Place	Drinking Water	Shed	Road	Platform	Electricity	Storage	Toilet	Permanent shop	Cycle stand	Proper drainage
Vegetables	49	31 (63.27)	49 (100.0)	31 (63.27)	29 (59.18)	34 (69.39)	49 (100.0)	21 (42.86)	46 (93.88)	44 (89.80)	26 (53.06)	44 (89.80)
	43	29 (67.44)	43 (100.0)	30 (69.77)	24 (55.81)	32 (74.42)	43 (100.0)	19 (44.19)	40 (93.02)	42 (97.87)	26 (60.47)	38 (88.37)
	6	2 (33.33)	6 (100.0)	1 (16.67)	5 (83.33)	2 (33.33)	6 (100.0)	2 (33.33)	6 (100.0)	2 (33.33)	-- --	6 (100.00)
FFruits	4	2 (50.00)	4 (100.0)	3 (75.00)	3 (75.00)	3 (75.00)	4 (100.0)	2 (50.00)	3 (75.00)	3 (75.00)	3 (75.00)	4 (100.0)
	3	1 (33.33)	3 (100.0)	2 (66.67)	2 (66.67)	2 (66.67)	3 (100.0)	1 (33.33)	2 (66.67)	2 (66.67)	3 (100.00)	3 (100.0)
	1	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	-- --	1 (100.0)
Total	53	33 (62.26)	53 (100.00)	34 (84.15)	32 (80.38)	37 (69.81)	53 (100.0)	23 (43.40)	49 (92.46)	47 (88.68)	29 (54.72)	48 (90.57)
	46	30 (65.22)	46 (100.00)	32 (89.57)	26 (56.52)	34 (73.91)	46 (100.0)	20 (43.48)	42 (91.30)	44 (95.65)	29 (63.04)	41 (89.13)
	7	3 (42.86)	7 (100.00)	2 (28.57)	6 (28.57)	3 (42.86)	7 (100.0)	3 (42.86)	7 (100.0)	3 (42.86)	-- --	7 (100.00)

Note : Figures in brackets indicate percentage.

Source : Based on field data.

XII. EXPECTED INCREASE IN ARRIVALS AFTER MARKET IMPROVEMENT

The foregoing analysis indicates that in the rural market of Baragaon : (i) market infrastructural facilities are mostly absent, (ii) the farmers/traders of the market want

improved facilities, and (iii) farmers/traders are already paying much more market fee than minimum required to create these facilities. In view of this, an attempts is being made to assess that how much increase in turnover of different agricultural commodities would result on account of provision of improved infrastructural facilities. This exercise has been presented in Table-12. It is shown in Table-12 that the arrivals of vegetables are expected to grow by more than 69 per cent and fruits by 158 per cent. In total, the arrivals of both types of agricultural commodities are expected to experience a growth of around 73 per cent per market day if improved market infrastructural facilities are made available in this market. The total increase in market arrivals of all the agricultural produce is estimated to increase on account of increase in arrivals of existing shops and also on account of increase in number of new shops of around twenty (20).

Table-12: Expected Increase in Arrivals of Agricultural Produce After Market Improvement in the Baragaon Market

Commodities	Vegetables	Fruits	All Agricultural Produce
Number of Sample Shops	49	4	53
Total Qty. expected to be sold by sample shops per market day (Kg.)	4945	215	5160
Average Qty. expected to be sold by sample shops per market day (kg.)	100.92	53.75	97.36
Total No. of Shops in the market	150	8	158
Total Qty. Expected to be sold per market day in existing shops (kg.)	15138.0	430.00	15382.88
Expected increase in number of Shops	16	4	20
Expected turnover of new entrants (kg.)	1614.72	215.00	1947.20
Total expected increase in turnover per market day (kg.)	16752.72	645.00	17330.08
Actual Qty. sold per market day (kg.)	9900.00	250.00	10014.04
Percentage Increase	69.22	158.00	73.06

Source : Based on field data.

XIII. EVALUATION OF ECONOMIC BENEFITS EMANATING FROM MARKET IMPROVEMENTS IN THE BARAGAON MARKET

Apart from channelizing fresh agriculture produce from farm level to final consumers there are other economic benefits which are likely to be generated in the process of market improvements. In fact, these benefits should be considered as an important factor and as a basis for taking up the task of Rural Market Improvement Programme. There are many economic benefits emanating from improved Rural Market infrastructure. These may broadly be grouped under following categories:

4. As an outcome of market improvements increased volume of agricultural produce resulting in comparatively lower or constant per unit marketing cost.
 5. Improved efficiency of market operations in the form of better product display, better facilities and availability of more marketing hours for the buyers and sellers result in higher per unit price of agricultural produce.
 6. Reduction in spoilage of perishable crops, vegetables and fruits with the availability of improved rural marketing infrastructure.
-
- I. It is very logical to put up the idea before farmers/traders of the market that for availing better market infrastructural facilities they should bear higher market fee. But in typical case of Baragaon rural wholesale market, any further hike in market fee per market day is not required because the existing market fee rates are more than enough to bear the cost of infrastructural facilities for market improvement. As a result of future market improvements some (30) new shops are expected to generate additional market

fee by joining the Baragaon market for availing improved infrastructural facilities in Baragaon wholesale market.

Table-13 presents the detailed picture of market fee collection from different traders/farmers for selling their produce under improved market conditions. As per Table-13, per market day average market fee collection from all existing shops estimated to be Rs.3681.00. The rate of market fee being same. The total market fee collection per market day is likely to increase because some 30 new shops will join the market on account of market improvement. Thus, total increased number (199) shops are likely to generate a sum of Rs.4314.00 as market fee per market day in Baragaon rural market. If we consider it on annual basis, the total increased average revenue is likely to be generated as Rs.157400.00.

Table-13 : Actual Market Fee Paid and Increased Market Fee Expected to be paid by Traders/Farmers of Baragaon Market

Commodities	Total No. of Shops	Present Potential of Market Fee (Per Market Day)	Expected Total No. of Shops After Market Improvement	Total Increased Market-Fee Required for Market Improvements (Per Market Day)
Vegetables	150	3375	166	3735.00
Fruits	8	176	12	264.00
Small Eatables	4	60	8	120.00
Tea Shops	4	40	7	105.00
Betels Shops	3	30	6	90.00
Total	169	3681	199	4314.00

Source : Based on field data

Despite increased market fee collection, in real terms, per unit cost of improved marketing facilities in case of all produces sold in the market either remains same or marginally low in case of Baragaon market. Table-14 shows that there will be no

increase in market fee collection hence there will not be any percentage increase in market fee collection in case of Baragaon rural market. As against this, due to increased market turn over of 5160 kgs. per market day per unit cost of marketing is likely to go down to Re.0.23 from Re.0.35 per kg. after market improvements. This shows that an overall 34.29 per cent reduction in per unit marketing cost is likely to be realized by the farmers/traders in Baragaon market after market improvements. The percentage reduction in per unit cost of marketing is likely to vary from 41.43 per cent to 35.29 per cent in case of different agricultural produces sold in the market. The estimated reduction in per unit marketing cost may go further down with the increased sale in the market in due course of future time. Thus, provision of improved market facilities coupled with reduced marketing cost from the very beginning after market improvements in Baragaon market may be considered to be a significant economic benefit.

Table-14 : Change in Marketing Cost Before and After Market Improvement

Commodities	Present Market Turn Over of Sample Shops (Per Market Day) (Kg.)	Total Market Fee can be Collected from Sample Shops Per Market Day at Present (Rs.)	Expected Market Turn-over after market improvement in sample shops (Kg.)	Total Required Collection as Market Fee from Sample Shops (Rs.)	Percentage Increase in Fee Collection after Market Improvement (Rs.)	% reduction in Per Unit Marketing Cost (Rs.)
Vegetables	3234	1102.5(0.34)	4945	1102.50(0.22)		35.29
Fruits	125	88.0(0.70)	215	88.00(0.41)		41.43
All Agricultural Produce	3359	1190.5(0.35)	5160	1190.50(0.23)		34.29

Note : Figures in parentheses denote per unit cost of marketing.

Source : Based on field data

II. With the availability of improved marketing facilities and infrastructure in the daily market of Baragaon farmers/traders are expected to maintain the quality of their products to be sold in the market. In other words, they will be able to bring their produce in the market in a more presentable manner. Buyers will also feel more comfortable and confident while purchasing the agricultural produce under improved marketing conditions. Under such improved market conditions sellers of produce may very easily justify at least 5 per cent increase in the prices of their produce. As there would be no increase in per unit cost of marketing of agricultural produce. The hike in commodity prices would be a net gain to the farmers/traders selling their produce in the market of Baragaon.

Table-15 exemplifies the net gain coming out of 5 per cent hike in average prices of agricultural and other produces on account of improved market efficiency in the rural market of Baragaon. These estimates are based on quantity and prices of vegetables and fruits recorded from sample shop owners in Baragaon rural market of Baragaon block in district Varanasi. However, the estimates are approximate because the factor of seasonality has not been taken into consideration. It is evident from figures that under this process the highest gainers are farmers/traders engaged in the trading of vegetables followed by farmers/traders dealing in fruits. Figures presented in Table-15 also show that all the farmers/traders involved in the trading may gain a sum of Rs.893826.60 per annum with the introduction of market improvement at the new market site in Baragaon rural wholesale market.

Table-15 : Estimation of Net Gain in Marketing Under Market Improvement

Commodities	Estimated Total Value of Commodities sold per market at present (Rs.)	Estimated value of commodities to be sold per market day after market improvements (at current prices) (Rs.)	Estimated Value of Commodities to be sold after market improvements 5% high prices (Rs.)	Net gain per market day (Rs.)	Net gain per annum (Approx.) (Rs.)
Vegetables	24750	41881.80	43975.89	2094.09	764342.85
Fruits	2750	7095.00	7449.75	354.75	129483.75
Total	27500	48976.80	51425.64	2448.84	893826.60

Source : Based on field data

Other indirect economic benefits are also involved in the process of efficient marketing system. A transparent and efficient system, as suggested for Baragaon market, will reduce the interference of middlemen and brokers in the determination of agriculture and other produce prices in the market. This will result into the direct benefit to farmers/traders on account of increased prices. This gain may lead to expansion of agricultural activities, resulting in higher production in the hinterland of Baragaon market.

III. Erection of marketing infrastructural facilities in Baragaon market may provide special benefit in the trading of perishable produce like vegetables and fruits. In case of vegetables and fruits, availability of facilities like water shed, light and storage may reduce at least 20 per cent spoilage of arrivals in the Baragaon market.

Data relating to proportion of vegetables in total market turn over of agricultural produce come around 58 per cent in Baragaon market. It is expected to go higher with the availability of above listed infrastructural facilities. In case of fruits the spoilage rate is found to be over 40 per cent during the peak season in this market.

With the availability of watershed and storage, the spoilage rate under such conditions may go down to less than 20 per cent. In case of meat and fish marketing (in case it is brought in market), the availability of better infrastructural facilities will reduce the spoilage of these produce to a considerable extent. Apart from this, the hygienic conditions will also be maintained with the availability of these facilities in the market. Under the ordinary conditions the spoilage of fruits and meat products is 25 to 35 per cent and it could be reduced to 15 to 10 per cent with the availability of required infrastructural facilities in Baragaon market of Baragaon block.

XVI. FINANCIAL AND ECONOMIC APPRAISAL OF INVESTMENT IN RURAL MARKET OF BARAGAON

Introduction

Rural markets are a hub-centre of socio-economic activities in a region. Along with public services such as Primary Health Centre, Veterinary Hospital, Post Office, Bank, Educational Institutions, Play Ground, PCO, Police Station, etc., they provide a fillip to the tempo of social, cultural and economic growth of the region comprising of a number of villages from where buyers and sellers of goods and services are attracted to these markets.

Existing conditions in some such markets are far from satisfactory. A typical market may consist of some stalls of a temporary nature and sellers sit on ground and on chabutras of houses and shops, open to sky without any shed or cover. Quite often they are held once, twice or thrice a week during the afternoon hours. Some may be the daily markets also.

The products traded in such markets include vegetables, fruits, flowers, edible oil, spices, jaggery, foodgrains, meat, fish, ready made wears, chappals, sweets, chhats, general goods and services of cobblers, smiths, barbers, etc. Arrival of commodities in the market fluctuates, depending upon the season and other factors.

Catchment area of such rural markets comprises of a large number of smaller and big villages in the vicinity of the village in which the market is held. Total catchment area of such markets may cover a distance of some 6-8 kms. comprising of 10-15 villages or even more.

The following are some of the important infrastructure and public utilities usually required in such markets:

- (1) Pucca open platforms
- (2) Shaded platforms
- (3) Pucca Shops
- (4) Space for Market Information Centre and Office for Market Management Committee
- (5) Room for Security Guard
- (6) Place for parking of cycles, scooters, buggies, horse-carts, tractor-trolleys, etc.
- (7) Storage facility

- (8) Electrification
- (9) Drainage facility
- (10) Boundary wall and Fencing around the haat area with the gates
- (11) Construction of Roads
- (12) Cattle Shed with drinking water facilities
- (13) Drinking wader
- (14) Toilets
- (15) Place for waste disposal
- (16) Plantation of trees

Management of the Market

Quite often the rural market is managed by the Gram Panchayat which realizes 'Tehbazari' from the traders. Another alternative arrangement is that the contract is awarded to a contractor for a stipulated amount per period and the contractor collects Tehbazari from the shopkeepers at predetermined rates. Gram Panchayat may form a "Market Management Committee" (MMC) to monitor the various activities of the market. The committee may take decisions on the mode of maintenance, management, rate of Tehbazari, method of its realization and settlement of disputes related to the market.

Construction of a market with covered and open pucca platforms, fencing around the area and facilities for storage, toilets, water supply, proper drainage and parking, etc. can bring about an improvement in the conditions in such rural markets. Shopkeepers are willing to pay the 'Tehbazari' at higher rates provided proper facilities are developed.

Financial Analysis of Investment in Infrastructure

Initial investment is required on land and on capital cost involved in the creation of infrastructural facilities described above. Land for rural market could be the land owned by the Gram Panchayat, so that no investment is required to be made on this count.

Upkeep of the infrastructure is a must for the sustainability and trouble-free services. Below we provide estimates of expenditure (both capital and revenue type) required to be made in Baragaon market located in Baragaon Block of Varanasi District, for which this feasibility study is being carried out (For details of the mathematical approach involved in this, see the Appendix given at the end).

XVII. FINANCIAL ANALYSIS OF PROPOSED INVESTMENT IN BARAGAON MARKET

Here we evaluate financial viability for providing facilities for the improvement of infrastructural facilities and other amenities in the rural market of Baragaon. Parameters involved in the financial analysis are detailed below:

1. Initial Capital Investment

Since the Baragaon market, at present, lacks infrastructural facilities therefore substantial amount will have to be spent on the modernisation of the market. Platform/sheds need to be constructed, water supply is to be arranged and other infrastructural facilities are to be provided. All this would require capital expenditure. According to our estimate, Rs.12,00,00/- would be needed as initial capital, which will

have to be spent over a time span of one year. This may be termed as initial capital investment. We also assume that the entire capital investment will be made instantaneously at the beginning of the year. This is not an unrealistic assumption.

2. Life Span of the Project

The market infrastructural facilities proposed to be provided in the Baragaon market would have usefulness for a fairly long period of time though depreciation is bound to take place with the passage of time. The actual life span of the project cannot be estimated with high degree of accuracy but on the basis of technical opinion of the Architect/Civil Engineer, it is assumed that the facilities proposed to be provided would last for a period of at least 15 years. It may not be unrealistic to assume that the facilities provided would remain useful even for a period of 20 years and above. In case of Baragaon market, we have taken the life span of the project to be 15 years. Thus, scrap value of the initial infrastructural facilities created at a cost of Rs.12,00,000 has been treated as 30% of the initial capital cost.

3. Cost of the Capital

Cost of the capital for project is a critical factor which determines the viability of project. Cost of capital based on the competitive interest rates prevailing in the market would be too high if considered for this market. For socially desirable activities, it is even worthwhile to examine the financial viability at a relatively lower cost of capital. In practice also, the agencies involved in financing socially desirable activities encourage development of infrastructural facilities at a lower rate of capital cost. The projects so

financed have plethora of social benefits, apart from financial benefits emanating from the project financed.

Keeping all this in view, 12 per cent annual cost of capital has been considered in the financial analysis of the Baragaon Market.

4. Cost of Repair and Maintenance

The proposed facilities to be provided in the market are bound to depreciate over the passage of time. Proper maintenance and upkeep of facilities in good condition is a social as well as economic necessity.

Keeping this objective in view, adequate provision has been made to account for the cost likely to arise on account of repair and maintenance. Items of expenditure under this head are as follows:

- (a) Expenditure on labour, materials and overheads for repair and maintenance of facilities;
- (b) Repair/Replacement of water pumps, electrical equipments and accessories etc. from time to time;
- (c) Salaries and wages payable to persons employed for the upkeep of facilities created by the project.

Details of annual maintenance expenditure are as follows:

1.	Watchman for Security @ Rs.1500 per month	Rs.18,000
2.	Sweeper for cleaning for 104 days @ Rs.40 per day	Rs. 14,600
3.	Electrical Maintenance for 104 days @ Rs.100 per day	Rs.34,500
4.	Maintenance of Handpump	Rs. 1,000
<hr/>		
	Total	Rs.70,100
<hr/>		
The above expenditure is expected to increase @ 5% annually.		

Technical estimates suggest that there would be zero expenditure on repair and maintenance of the project during the first year. It is assumed that during second and third years, 2 per cent of the initial investment would be required for repair and maintenance. During the years 4 to 7, this will be 3% of the initial investment and thereafter @ 5 per cent of the initial capital investment will be needed for repair and maintenance of civil work and other infrastructural facilities till 15th year.

5. Revenues Arising from the Market

The completion of the market improvement programme would result into substantial improvement in the working conditions of the Baragaon market. Farmers and traders would get a sizeable and respectable place to sit in and transact the business.

They would be saved from the inconvenience arising due to limited space, open sale and bad weather. There is always a good-will value associated with a good looking shop.

As a result of improved facilities in the market it is expected that on account of availability of improved facilities the users of market would be willing to pay an increased market fee and rent for using these facilities.

Views of farmers/traders were solicited on the required market fee recoverable from them after market improvement programme is carried out. Incremental increase in revenue due to creation of infrastructural facilities has been put at Rs.1574000 in the initial year. This is expected to go up @ 10% per annum.

NPV (Net Present Value) of Investments in the Projects

Based on the assumptions stated above, the sources of cash inflows and outflows are as follows:

Inflows

- (a). Expected increase in revenue (Beginning at Rs.15,74,000 per annum and going up @ 10% per annum)
- (b) Terminal value of initial investment (after 15 years from now) (30% of initial capital cost)

Outflows

- (c) Initial capital cost (Rs.12,00,000)
- (d) Cost of Repair and Maintenance (Rs.70100 in the initial year and expected to increase @ 5% per annum)

(e) Cost of maintenance of civil work and other infrastructural facilities (2% of capital cost in years 2 and 3, 3% in years 4 to 7, and 5% from years 8 onwards).

Table 16: Computation of NPV and IRR on the basis of Expected Cash Flows (Financial Point of View)

Year	Addl. Revenue Generated (based on increase @ 10% p.a.)	Terminal Value	Initial Capital Cost	Cost of Repair & Maintenance (based on increase @ 5% p.a.)	Rate of Increase in the Maintenance cost of civil work	Cost of Maintenance of Civil Work (based @ 2% of initial investment in years 2&3 and 5% thereafter)	Net Cash Flow
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
0			1200000				(1200000)
1							0
2	1574000			70100	0.02	24000	1479900
3	1731400			73605	0.02	24000	1633795
4	1904540			77285	0.03	36000	1791225
5	2094994			81150	0.03	36000	1977844
6	2304493			85207	0.03	36000	2183286
7	2534943			89467	0.03	36000	2409475
8	2788437			93941	0.05	60000	2634496
9	3067281			98638	0.05	60000	2908643
10	3374009			103570	0.05	60000	3210439
11	3711410			108748	0.05	60000	3542662
12	4082551			114186	0.05	60000	3908365
13	4490806			119895	0.05	60000	4310911
14	4939886			125890	0.05	60000	4753997
15	5433875	360000		132184	0.05	60000	5601691

NPV = Rs.13751692; IRR = 79% per annum

Based on a cost of capita of 12%, the NPV of the project is Rs.13751692.

However, with changes in the cost of capital the NPV of the project is as follows:

Table 17: Impact of Changes in Cost of Capital on Net Present Value

Cost of Capital	NPV (in Rs.)
0.06	22964251
0.08	19216634
0.10	16199863
0.12	13751692
0.14	11749258
0.15	10884984
0.16	10098838

Additional revenue arising due to the proposed investment on infrastructural facilities is expected to be Rs.15,74,000 per annum in the initial year. However, if this falls short of the expectations, NPV becomes negative. In the tables below, the NPV and IRR are given for different amounts of additional revenue generated in the initial year ranging from Rs.1500000 to as high as Rs.1675000 along with the rates of growth in the revenues ranging from 5% per annum to 20% per annum.

Table 18 : Table Giving NPV at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)						
	1500000	1574000	1600000	1625000	1650000	1675000	
0.05	9466389	10027871	10225148	10414837	10604527	10794217	
0.06	10079971	10671722	10879635	11079551	11279467	11479383	
0.08	11444117	10103166	12334724	12557375	12780027	13002679	
0.10	13015139	13751692	14010481	14259317	14508152	14756988	
0.12	14826081	15651974	15942153	16221170	16500188	16779206	
0.14	16915104	17844056	18170444	18484279	18798114	19111949	
0.15	16077402	19063693	19410228	19743435	20076641	20409648	
0.20	25325270	26669123	27141287	27595292	28049296	28503301	

Table 19 : Table Giving IRR at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)						
	1500000	1574000	1600000	1625000	1650000	1675000	
0.05	0.727	0.752	0.761	0.769	0.778	0.786	
0.06	0.734	0.760	0.768	0.777	0.785	0.793	
0.08	0.750	0.775	0.784	0.792	0.800	0.809	
0.10	0.765	0.790	0.799	0.807	0.815	0.824	
0.12	0.780	0.805	0.814	0.822	0.830	0.839	
0.14	0.796	0.820	0.829	0.837	0.846	0.854	
0.15	0.803	0.828	0.837	0.845	0.853	0.861	
0.20	0.842	0.866	0.875	0.883	0.891	0.899	

Accumulations in the Sinking Fund

Surpluses of revenues over expenditure can be used for further expansion of facilities in the market and for providing additional facilities to sellers and buyers. These funds can be invested in safe and profitable investment avenues with a view to get a lump sum amount of money which can be used for replacement of infrastructural facilities when they get decayed and outdated. The deposits in the fund are expected to be as follows, depending upon the rate of interest earned on investments:

Table 20: Table giving accumulated value of Deposits made in the Sinking Fund at Different Rates of Interest, as at the end of 15 years

Rate of Interest	Revenue of the Initial Year (Rs. in Lakh)					
	1500000	1574000	1600000	1625000	1650000	1675000
0.08	615.82	647.65	658.83	669.59	680.34	691.10
0.09	652.08	685.81	697.66	709.05	720.45	731.84
0.10	691.07	726.84	739.40	751.48	763.57	775.65
0.11	732.99	770.95	784.29	797.11	809.93	822.76
0.12	778.07	818.39	832.56	846.18	859.80	873.42
0.13	826.57	869.42	884.47	898.95	913.43	927.91
0.14	878.73	924.31	940.33	955.72	971.12	986.52
0.15	934.85	983.36	1000.41	1016.80	1033.19	1049.58

ECONOMIC ANALYSIS

The following intangible benefits of the investment are particularly noteworthy:

- (1) Increase in the value of transactions carried out in the market
- (2) Benefits for women
- (3) Technology dissemination and technology development
- (4) Reduction in spoilage
- (5) Dissemination of market intelligence
- (6) Encouragement in the trade of agricultural and horticultural produce

As is quite obvious, if we take into consideration the impact of the above mentioned intangible factors on the NPV or IRR of the project, then investment on infrastructure in a rural market becomes a highly profitable proposition. Detailed

calculations incorporating various aspects of social cost benefit analysis have not been carried out.

We have considered in this study the financial dimensions of the project and have gathered information relating to financial viability. Ultimate success of the project would depend on how imaginatively the project is managed in all its aspects. In this regard, sound financial management is of great importance.

There are considerable moral and cultural benefits accruing from the investment. Such investment cannot be looked as an instrument merely for solving the problems of poverty and backwardness. The real contribution of the investment is in terms of enhancing the quality of life of the people in the region. The project would be advantageous from different view points.

Some such non-tangible benefits accruing from investment in the project are detailed below:

- (1) Markets are held under unhygienic conditions as at present. Food articles, vegetables are kept under exposed conditions and become carriers of diseases and ailments. The project would create healthy and hygienic conditions and thereby the physical well being of the people would be improved.
- (2) Market is a place of social interaction. It is a venue where people belonging to the region converge for a day or two in a week and buy articles of daily consumption. Improved condition in the market enables people to buy good quality products and thus the quality of life would be improved.

- (3) Political and social reform activities are conducted through these markets. Improved conditions in the market would attract more and more people to come to the market and derive benefits.
- (4) Improved conditions in the market could lead to increased business activities and increased arrival of articles of consumption. More business transactions would be carried out through the market and consequently more employment as well as income generation opportunities would be opened up.
- (5) Consciousness about new products and technology, etc. would be spread through the market. This would lead to improvement in the living standards of people. Companies can launch new products and processes suited for local consumption through these markets.
- (6) Climatic conditions reach extreme level during summer, winter and rainy seasons. Conditions become extremely bad particularly during the rainy season and the arrivals of articles is adversely affected. During summer also, when temperature level reaches high, it becomes very difficult both for the traders as well as the customers to visit the market. During winter season also, chilly winds prevent customers and traders to visit the market. Improved conditions would increase the number of days during which the markets are held.
- (7) When markets are not held regularly or when customers do not arrive in adequate numbers, agricultural produce particularly the perishable vegetables get spoiled or they have to be sold at low price resulting into loss for the producers as well as consumers. Poor and vulnerable sections of the society are particularly harmed on account of poor conditions in the market.

- (8) Improvement in the market would lead to increased economic activity in the region. It would lead to more efficient and effective utilization of the natural as well as man-power resources available in the region.
- (9) Cultural activities would be encouraged through improved working conditions. Social welfare and reform activities can also be carried out more easily by improving the conditions in the market.

In a nutshell, the conditions in the market indicate the level of development of civilization. The investment under consideration is a contribution towards civilizational development and thus carries within it several non-financial and non-economic benefits.

If these are taken into consideration, the true value of NPV and IRR is much higher than has been computed in the study. This is shown in the table below. Here we have added an amount equal to 10% of the incremental trading caused due to generation of infrastructural facilities in the market. Savings caused due to reduction in spoilage @ 2% of the additional trading have also been added.

Table 21 : Computation of NPV and IRR on the basis of Economic Analysis

Cash Flow on the basis of Financial Analysis	Benefits of Increase in Trading	Benefit due to Reduction in Spoilage	Total Cash Flow
1479900	89383	17877	1587159
1633795	93852	18770	1746417
1791255	98544	19709	1909508
1977844	103472	20694	2102010
2183286	108645	21729	2313661
2409475	114077	22815	2546368
2634496	119781	23956	2778234
2908643	125770	25154	3059567
3210439	132059	26412	3368910
3542662	136662	27732	3709956
3908365	145595	29119	4083079
4310911	152875	30575	4494361
4753997	180518	32104	4946619
5601691	168544	33709	5803944
NPV = 14565531; IRR = 82.333%			

WORDS OF CAUTION

Financial viability of the project depends primarily on :

- (1) Surplus of Revenue over expenses (Net Cash Flow); and
- (2) The cost of capital.

In the table-22 given below, we have calculated the requirements of net cash flow based on different life spans of the project ranging between 15 to 40 years and on the basis of cost of capital ranging between 5% to 18% per annum for an initial investment of Rs.12,00,000 on the infrastructural facilities in the market. The results are quite

revealing in the same that if the market fails to generate a minimum revenue as given in the table, the investment would not be financially viable proposition.

Table 22 : Table Giving Equivalent Annual Cost for Different Life Span of the Project at Different Costs of Capital

Cost of Capital (k)	Life of Project (n) (in Years)					
	15	20	25	30	35	40
0.05	115611	96291	85143	78062	73286	69934
0.06	123555	104621	93872	87179	82769	79754
0.08	140195	122223	112415	106593	102964	100632
0.10	157769	140952	132202	127295	124428	122711
0.12	176189	160655	153000	148972	146780	145564
0.15	205220	191714	185639	182760	181362	180675
0.16	215229	202400	196815	194263	193071	192508
0.18	235683	224184	219503	217517	216661	216288

APPENDIXMATHEMATICAL APPROACH INVOLVED IN THE APPRAISAL OF
INVESTMENT ON INFRASTRUCTURE IN A RURAL MARKET

Let the initial investment on the development of infrastructural and public utilities in a market be Rs. 1. It takes about one year to complete the construction of the facilities and these are available for use after a period of one year since construction commences. It is assumed that incremental expenditure on maintenance of the facilities is incurred all at the end of every year and commences from the end of 2 years since construction starts. This same logic holds for incremental revenues also. The gap between incremental revenues and incremental expenditures (i.e. surplus of revenues over expenditures) is assumed to be Rs.X in the beginning (i.e. at the end of 2 years since construction etc. starts) and this increases in real term, @ g per annum. Useful life span of the initial investment is taken to be 14 years with an assumed depreciation @ 5% per annum simple, so that the terminal value of the infrastructural facilities created in the first year would remain to be 30% of the initial investment 1. Cost of capital is assumed to be 'k' per annum.

Based on the above logic,

$$I = \frac{X}{(1+k)(g-k)} \cdot \frac{1}{[(1+k)^{15} - 0.30]} \quad X, \text{ and}$$

$$\frac{1+g}{1+k}^{14} - 1 \quad (1+k)^{15}$$

$$X = \frac{[(1+k)^{15} - 0.30] (1+k)(g-k)}{[(1+k)^{15} \left(\frac{(1+g)^{14}}{(1+k)^{14}} - 1 \right)]}$$

If k and g are assumed to be 12% and 10% respectively, the above expression becomes

$$I = 10.53 \cdot X \cdot (Bx), \text{ or equivalently}$$

$$X = 0.095 \cdot I \quad (C \cdot I)$$

If cost of capital (k) ranges between 6% to 15% and the growth in surplus (g) ranges between 5% to 20%, the following matrix giving the values of the coefficients involved in the above expression $X = .095 \cdot I$ is generated.

Table 23: Table giving the values of 'C' in the expression $X = C \cdot I$, at different rates of cost of capital and rates of growth

$g = \text{rate of growth in surplus of revenues over expenditures}$	$k = \text{Cost of capital}$						
	0.0600	0.0800	0.1000	0.1200	0.1400	0.1500	
0.0500	0.0746	0.0900	0.1067	0.1246	0.1437	0.1538	
0.0600	NA	0.0849	0.1009	0.1182	0.1367	0.1465	
0.0800	0.0620	NA	0.0901	0.1061	0.1234	0.1326	
0.1000	0.0546	0.0668	NA	0.0950	0.1110	0.1195	
0.1200	0.0479	0.0589	0.0712	NA	0.0995	0.1074	
0.1400	0.0419	0.0518	0.0629	0.0753	NA	0.0962	
0.1500	0.0392	0.0486	0.0591	0.0709	0.0840	NA	
0.2000	0.0277	0.0348	0.0429	0.0520	0.0624	0.0680	

($X = \text{Surplus of revenue over expenditure required to be generated at the end of year 2}$, $I = \text{Initial capital outlay}$, $C = \text{Coefficient values computed on the basis of the assumptions stated in the model}$)

The above table acts as a ready reckoner to ascertain the amount of surplus of revenues over expenditures required to be generated on annual basis with a constant annual growth rate of 'g' and a given cost of capital 'k' in order to justify (on the grounds of financial viability) the initial investment of Rs.1 in a market. As an example, if initial capital outlay on a market is Rs.10 lakhs, then $.095 \times$ Rs.1000000 = Rs.95000 is the annual surplus of revenues over expenditures which is required to be generated at the end of the initial year (i.e. year 2) in which facilities are made available for use. This should grow annually @ 10% per annum ($g=10$) in order to make the project viable from financial point of view.

Reciprocals of the values given in the table 21 above, gives the values of B in the expression $I = BX$. Results are as follows:

Table 24: Table giving the values of 'B' in the expression $I = BX$ at different rates of cost of capital and rates of growth

$g = \text{rate of growth in surplus of revenues over expenditure}$	$k = \text{Cost of capital}$					
	0.06	0.08	0.10	0.12	0.14	0.15
0.05	13.40	11.11	9.38	8.03	6.96	6.50
0.06	NA	11.77	9.91	8.46	7.31	6.83
0.08	16.13	NA	11.09	9.42	8.10	7.54
0.10	18.32	14.98	NA	10.53	9.01	8.37
0.12	20.88	16.97	14.05	NA	10.05	9.31
0.14	23.85	19.29	15.89	13.28	NA	10.39
0.15	25.52	20.58	16.91	14.10	11.91	NA
0.20	36.04	28.73	23.32	19.21	16.03	14.71

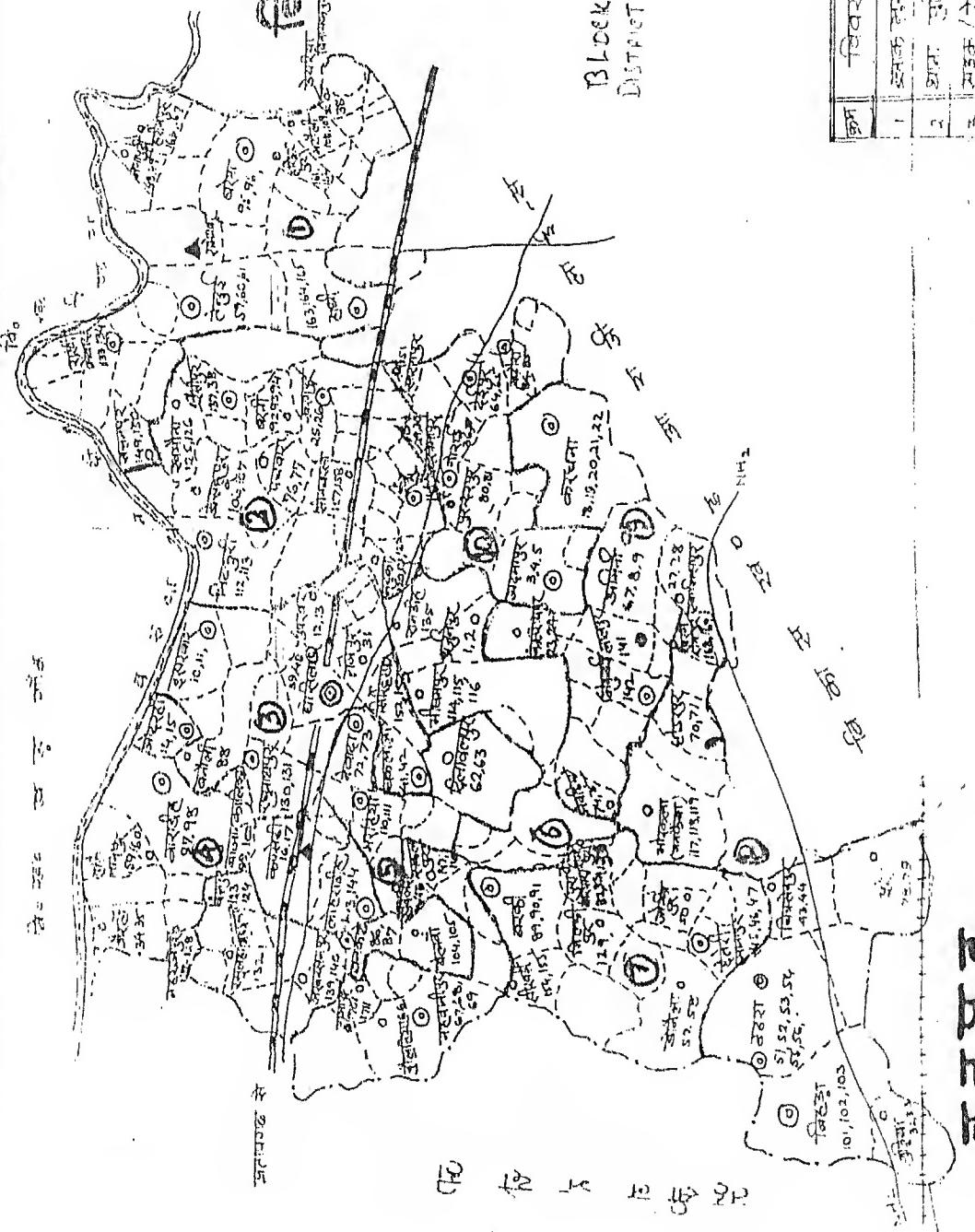
The above table acts as a ready reckoner to ascertain the maximum amount of capital investment, which should be made on the expectation of a given amount of surpluses of revenues over expenditures. As an example, if it is expected that a surplus of Rs.95000 can be generated in the initial year, then the investment will remain financially viable upto a maximum investment of $Rs.10.53 \times 95000 = Rs.10$ lakhs. An initial investment of an amount less than Rs.10 lakhs, which can generate a surplus of at least Rs.95000 in the initial year, is of course, a good investment proposition. The above result is true for a cost of capital 12% and the annual growth of surplus of revenues over expenditure @ 10% per annum. Other values given in the table are interpreted similarly.

**BADAURA RURAL MARKET
BLOCK SEVAPURI
DISTRICT VARANASI**

I. LOCATION OF THE BADAURA MARKET

Badaura rural market is the daily market. It is held on the sides of Banaras-Bhadohi road and Badaura – Deipur link road. This market is located at a distance of 24 kms. away from Vikas Bhawan, Varanasi. One has to travel towards Jausa on Bhadohi-Varanasi road. After Jausa, this market is located at 4 kms. on Bhadohi-Varanasi road. The market is being held on the road sides. Being on the road sides, market infrastructural facilities are non-existent. It is also not possible to develop such facilities at the present site. The Badaura Gram Panchayat, which claims its ownership over this market, does not collect any fee from the users of the market. However, Badaura Gram Panchayat is eager to develop this market at new site. It has already sent a proposal to the District Panchayati Raj Officer (DPRO), Varanasi in this regard. The hinterland of this market extends to large number of villages as could become evident from the discussion with the Badaura Gram Pradhan, sellers and buyers of this market and other acknowledgeable persons of this area. On this basis, the hinterland of market has been determined as follows:

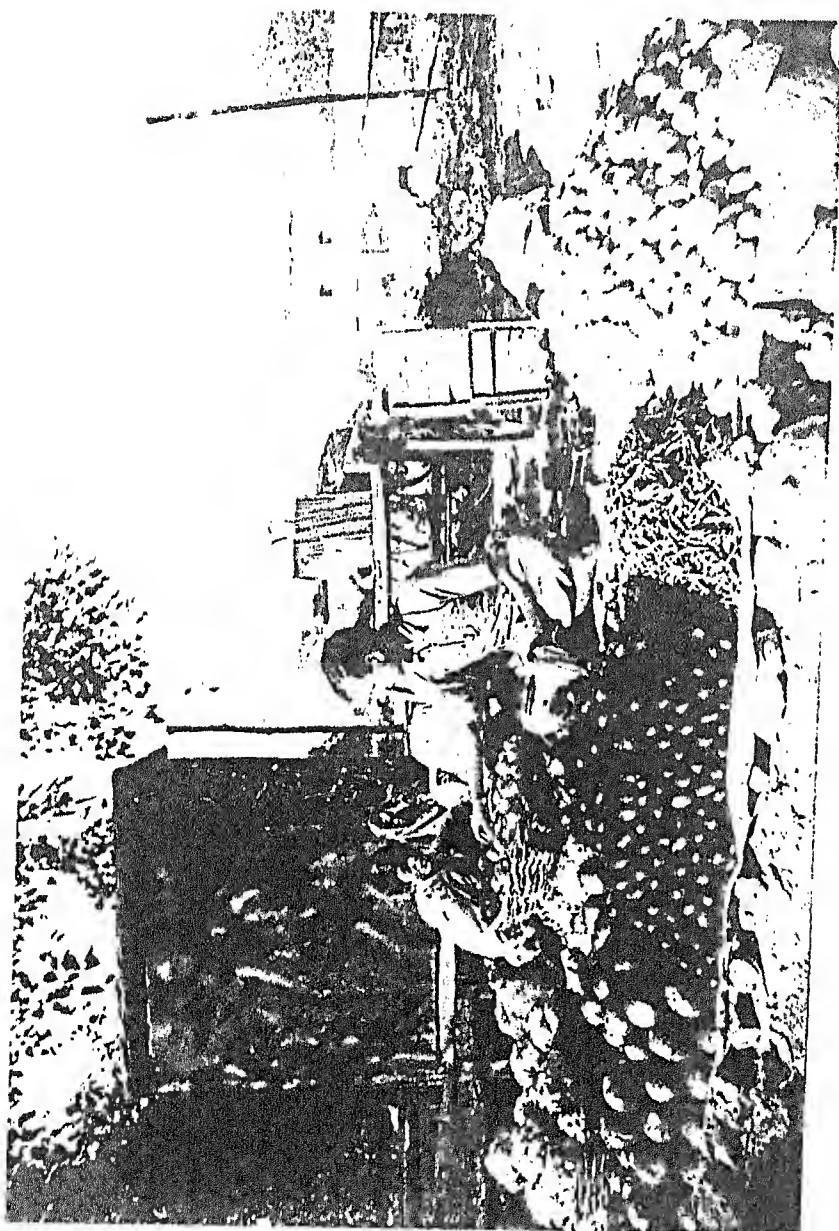
Name of the Village	Distance from the Market (in kms.)
1. Dasrathpur	2.50
2. Saharanpur	3.00
3. Jalalpur	2.00
4. Saurai	1.50
5. Purandarpur	1.50



BLOCK: SEWA PUP
DISTRICT: UJJAIN

क्रमांक	विवरण	दस्तक
१	इसके सम्बन्धित ग्राम	①
२	आगरा गुलस मोहन	●
३	सुकुम / रेखें लादन	—
४	सेवार	—
५	अधिकारीयाएं / संवेदनपत्र	③, ०

मानसहाय



A Trader Selling Vegetables In BADAU RA Market
in Varanasi.

6. Kardhama	3.00
7. Delpur	0.00
8. Badaura	0.00
9. Babapur	2.00
10. Tarsao	3.00
11. Bhadya	3.00
12. Saharpur	3.00
13. Jhabhra	1.50
14. Kamalpur	2.50
15. Singra	2.00
16. Heerapur	1.00
17. Sunarpur	2.00
18. Beduwa	1.00
19. Khargoopur	3.00
20. Adampur	3.00
21. Weerapur	1.00

II. STRUCTURE OF THE MARKET

The enumeration of shops in a market day by our research team revealed the fact there are 190 shops of different commodities. Out of the total shops, 73 per cent are of vegetables, 8 per cent of fruits, 5 per cent each of meat and fish and small eatables and

the remaining shops are of gur, masala, small agricultural implements and bangles. The complete structure of Badaura market has been shown in Table-1.

The table shows that out of total shops, 65 per cent are owned by the males and remaining 35 per cent by females. The 40 per cent shops of vegetables, 20 per cent of gur, 25 per cent of masala, 25 per cent of small eatables and 67 per cent of bangles are owned by the females. Among the total shops owned by females across different commodities, majority of them (91 per cent) sell vegetables.

Table-1 : Structure of the Badaura Market

COMMODITIES	TOTAL SHOPS			PERCENTAGE OF TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	90(60.00)	6(40.00)	150(100.00)	72.58	90.91	78.95
Gur	4(80.00)	1(20.00)	5(100.00)	3.23	1.52	2.63
Fruits	10(100.00)	--	10(100.00)	8.06	--	5.26
Masala	3(75.00)	1 (25.00)	4(100.00)	2.42	1.52	2.11
Meat, Fish	6 (100.00)	--	6(100.00)	4.84	--	3.16
Small eatables	7(75.00)	2(25.00)	8(100.00)	4.84	3.03	4.21
Small Agricultural Implements	4(100.00)	--	4(100.00)	3.23	--	2.11
Bangles	1(33.33)	2(66.67)	3(100.00)	0.81	3.03	1.58
Total	124(65.26)	66(34.74)	190(100.00)	100.00	100.00	100.00

Note : Figures in brackets indicate percentage.

Source: Based on field data.

III. SAMPLE OF THE MARKET

The sample selected for the study constitutes around 30 per cent. Across different commodities, 29 per cent of vegetable shops, 40 per cent of gur and 40 per cent of fruits shops were taken up for detailed study. Out of total shops owned by the males and females, 35 per cent and 21 per cent respectively were included in the sample as shown in Table 1.1.

In this way, in the sample the proportion of shops owned by the males and females are 73 per cent and 27 per cent respectively.

Table-1.1 : Sample of the Market

COMMODITIES	SELECTED SAMPLE SHOPS			PERCENTAGE OF SAMPLE SHOPS IN TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	30(69.77)	13(20.23)	43(100.00)	33.33	21.67	28.67
Gur	2 (100.00)	--	2 (100.00)	50.00	--	40.00
Fruits	4 (100.00)	--	4 (100.00)	40.00	--	40.00
Total	36(73.47)	13(26.53)	49(100.00)	34.62	21.31	29.70

Note : Figures in brackets indicate percentage.

Source: Based on field data.

IV. COMPOSITION OF THE MARKET

As evident from Table-2, the farmers and traders bring different commodities for sale in the market on any of the market day, i.e. Monday to Sunday (since the market is daily), it was estimated in enumeration that 56 per cent are farmers and 44 per cent are traders. Out of the total 150 sellers of vegetables, 70 per cent are farmers. In case of fruits shops, 20 per cent are of farmers. The remaining shops are of traders of different commodities.

On the basis of above, the Badaura market can be distinguished to have the following features:

1. It is the daily market
2. The Badaura market is mainly the market of local grown vegetables
3. It is the market of small local farmers as well as traders.

Table-2: Farmers and Traders Composition in the Badaura Market

Commodities	Farmers	Traders	Total
Vegetables	105(70.00)	45(30.00)	150(100.00)
Gur	--	5(100.00)	5(100.00)
Fruits	2(20.00)	8(80.00)	10(100.00)
Masala	--	4(100.00)	4(100.00)
Meat and Fish	--	6(100.00)	6(100.00)
Small eatables	--	8(100.00)	8(100.00)
Small agriculture implements	--	4(100.00)	4(100.00)
Bangles	--	3(100.00)	3(100.00)
Total	107(56.32)	83(43.68)	190 (100.00)

Source : Based on field data.

V. COMPOSITION OF THE SAMPLE

Keeping in view the composition of farmers and traders in selling of different commodities, more than half of the total farmers (63 per cent) and less than half of the total traders (37 per cent) have been included in the sample of study. In case of vegetables and fruits, 70 per cent and 25 per cent farmers are in the sample while the rest remain the sample traders as shown in Table-3.

Table-3: Farmers and Traders Composition in the Sample of Badaura Market

Commodities	Farmers	Traders	Total
Vegetables	30(69.77)	13 (30.23)	43 (100.00)
Gur	--	2(100.00)	2 (100.00)
Fruits	1(25.00)	3(75.00)	4(100.00)
Total	31(63.27)	18(36.73)	49 (100.00)

Source : Based on field data

VI. TURN OVER OF AGRICULTURAL PRODUCE IN BADAURA MARKET

The Badaura market is the daily market of mainly locally grown vegetables. It is evident that out of the total 190 shops, 150 shops sell small quantity of varied vegetables. Besides, taking into consideration of other agricultural commodities

like, gur and fruits, the number of shops increases to 165. The data collected from the sample shops showed that on an average 34 kgs. of vegetables are being sold by each vegetable shop followed by 8 kgs. of gur and 36 kgs. of fruits. On this basis, the total quantity sold by all shops per market day comes to 5144 kgs., 38 kgs., 363 kgs. and 5504 kgs. in respect of shops of vegetables, gur, fruits and all agricultural produce as evident in Table-4.

Table-4: Actual Turn Over of Agricultural Produce in Badaura Market

Commodities	No. of Shops in the Sample	Total Qty. Sold per Market Day by Sample Shops (Kg.)	Average Qty. sold per sample shop per market day (Kg.)	No. of Total shops in the market	Total Qty. sold by all shops per market day (Kg.)
Vegetables	43	1474.5	34.29	150	5143.50
Gur	2	15.0	7.50	5	37.50
Fruits	4	145.0	36.25	10	362.50
All Agricultural Produce	49	1634.5	33.36	165	5504.40

Source : Based on field data.

One of the conditions, as mentioned in the Terms of Reference (ToR) of UPDASP for the Feasibility Study of Rural Haat/Painth, 99 mentions that only those markets would be selected for the feasibility study, which have or expected to have within 4-5 years the annual turnover of more than 1000 MT of all

agricultural commodities. This pre-condition of market selection is justified in case of Badaura market because our estimate as shown in Table-5 indicates that this market has annual turnover of around 2009 MT of all agricultural produce at present. The annual turnover of vegetables has been estimated to be 1877 MT followed by 140 MT and 132 MT of gur and fruits respectively.

Table-5 : Annual Turn Over of All Agricultural Produce in the Badaura Market

Commodities	Turn Over (MT)
Vegetables	1877.38
Gur	13.59
Fruits	132.31
All Agricultural Produce	2009.11

Source : Based on field data.

VII. PERSONS INVOLVED IN BUYING AND SELLING

As per our enumeration, there are 190 shops of different commodities per market day in the Badaura market. In all the shops, more than one person is found to remain involved in selling. As far purchasing is concerned, the estimate comes that on an

average, 20 persons purchase from each shop per market day. Thus, a total 240 persons are estimated to be involved in selling and 3760 persons in purchasing of different commodities per market day. The maximum number of 192 and 3000 persons are estimated to remain involved in selling and buying of vegetables per market day. The commodity-wise number of persons estimated to be involved in buying and selling per market day in Badaura market has been shown in Table-6.

Table-6: Total and Average Number of Persons Involved in Selling and Buying Per Market Day in Badaura Market

Commodities	No. of Persons Involved in Selling	Average No. of Persons Involved in Selling	Total No. of Persons Involved in Buying	Average No. of Persons Involved in Buying	(No.)
Vegetables	192	1.28	3000	20	
Gur	5	1.00	50	10	
Fruits	10	1.00	188	19	
Masala	4	1.00	80	20	
Meat, Fish	8	1.33	120	15	
Small eatables	12	1.50	240	20	
Small Agricultural Implements	4	1.00	32	8	
Bangles	5	1.67	50	10	
Total	240	1.26	3760	20	

Source : Based on field data.

VIII. REVENUE POTENTIAL OF THE MARKET

The Badaura market is held daily and approximately 190 shops sell different commodities on each market day. However, no fee is levied on the sellers. It has been estimated by us that if minimum fee at the rate of Re.1/- per shop is imposed on each market day, approximately Rs.69350/- can be collected annually from the market as is evident from Table-7.

Table-7 : Present Potential of Market Fee in Badaura Market

Commodities	Total Shops	Potential Market Fee per Market Day (Rs.)	Potential Market Fee Per Annum (Rs.)
Vegetables	150	150	54750
Gur	5	5	1825
Fruits	10	10	3650
Masala	4	4	1460
Meat, Fish	6	6	2190
Small Eatables	8	8	2920
Small Agricultural Implements	4	4	1460
Bangles	3	3	1095
Total	190	190	69350

Source : Based on field data.

IX. MODE OF TRANSPORT USED

The farmers/traders bringing different commodities for sale in the market use three types of transport namely cycle, rickshaw trolleys, and bus/truck. It has been reported by the sample farmers/traders that around one-fourth of them also travel on foot to reach the market. In case of vegetables, which is the major commodity sold in the market around half of its seller bring it by cycle. The use of rickshaw trolleys has been reported by 14 per cent of vegetables and total sample farmers/traders. The sample farmers/traders have been classified according to the means of transport used by them to bring different commodities for sale in the market in Table-8.

Table-8: Farmers/raders Using Different Mode of Transport to Bring Agricultural Commodities

(No.)

Commodities	Cycle	On Foot	Bus/Truck	Rickshaw/ Trolleys	Total
Vegetables	21(48.84)	13 (30.23)	3 (6.98)	6 (13.95)	43 (100.00)
Gur	2(100.0)	--	--	--	2 (100.0)
Fruits	3(75.00)	--	--	1 (25.00)	4 (100.00)
Total	26(53.06)	13(26.53)	3(6.12)	7 (14.28)	49 (100.00)

Note : Figures given in brackets are percentage.

Source : Based on field data.

X. DISTANCE COVERED TO REACH THE MARKET

As observed earlier that Badaura market is important daily market of this area and its hinterland extends to its nearby villages. The farmers/traders come to this market by covering average distance of 1.48 kms. Around 51 per cent of total farmers/traders are found to be travelling the distance of less than 1 km. to reach this market as evident from Table-9.

The table shows that around 50 per cent farmers/traders of vegetables and gur cover the distance of less than 1 km. to come to this market whereas only 25 per cent farmers/traders selling fruits cover the same distance of less than 1 km. The average distance covered by the farmers/traders of fruits is also higher in comparison with the average distance covered by the sellers of vegetables and gur.

Table-9 : Classification of Sample Farmers/Traders According to the Distance Covered to reach the Badaura Market

Commodities	No. of Farmers/Traders			(No.)
	0-1 (km.)	1-3 (km.)	Total	
Vegetables	23(53.49)	20(46.50)	43 (100.00)	1.40
Gur	1 (50.00)	1(50.00)	2(100.00)	1.75
Fruits	1 (25.00)	3 (75.00)	4 (100.00)	2.25
Total	25 (51.02)	24(48.98)	49 (100.00)	1.48

Note : Figures in brackets indicate percentage.

Source: Based on field data.

XI. EXISTING FACILITIES IN THE MARKET

As observed in the market that vital infrastructural facilities are absent therein. This is so because the market is held on the both sides of the road. Only drinking water is available through hand pump. It also became evident that no facilities can be provided on the existing site of the market.

XII. NEED OF IMPROVED FACILITIES

As explained above, the Badaura market lacks vital infrastructural facilities. Therefore, utmost need is to be provided to improve facilities because all the sample farmers/traders have expressed their desire to have such facilities as evident from Table-10.

Table-10 : Need of Improved Marketing Facilities in Badaura Market

Commodities	Total No. of Farmers Shops	No. of Farmers Shops requiring improved facilities	No. of farmers willing to pay higher market fee	Total No. of Traders shops	No. of traders shops requiring improved facilities	No. of traders willing to pay higher market fee
Vegetables	30	30(100.00)	30(100.00)	13	13(100.00)	13(100.00)
Gur	--	--	--	2	2(100.00)	2 (100.00)
Fruits	1	1(100.00)	1(100.00)	3	3(100.00)	3(100.00)
Total	31	31	31	18	18	18

Note : Figures in brackets indicate percentage.

Source : Based on field data

It becomes evident that farmers/traders selling different commodities in the market need improved facilities and all of them are willing to pay higher market fee for using the improved facilities.

XIII. TYPE OF MARKETING FACILITIES REQUIRED

The farmers/traders of the market were enquired on the basis of PRA that what type of facilities they need. The PRA was applied more rigorously in case of female farmers/traders of the market. The views obtained from them have been presented in Table-11.

It reflects from the table that drinking water, shed, electricity, platforms, permanent shops and cycle stand are the main facilities needed by most of the sellers in market. The female farmers/traders want to have drinking water, toilet, electricity, platform and shed.

Table-11 : Type of Marketing Infrastructural Facilities Required by the Farmers/Traders of Badaura Market

Commodities	Total No. of Farmers/traders	Place	Dri-king Water	Shed	Road	Plat-form	Electri-city	Stor-age	Toilet	Perm-anent shop	Cycle stand	Proper drain-age
Vegetables	43	25 (58.14)	43 (100.0)	37 (86.05)	20 (48.51)	34 (79.07)	43 (100.0)	20 (46.51)	23 (53.49)	35 (81.40)	35 (81.40)	28 (65.12)
Male	30	20 (66.67)	30 (100.0)	28 (93.33)	15 (50.00)	22 (73.33)	30 (100.0)	18 (60.00)	10 (33.33)	25 (83.33)	30 (100.0)	20 (66.67)
Female	13	5 (38.46)	13 (100.0)	9 (69.23)	5 (38.46)	12 (92.31)	13 (100.0)	2 (15.38)	13 (100.0)	10 (76.92)	5 (38.46)	8 (61.54)
Gur	2	1 (50.00)	2 (100.0)	2 (100.0)	1 (50.00)	2 (100.0)	2 (100.0)	--	--	--	2 (100.0)	1 (50.00)
Male	2	1 (50.00)	2 (100.0)	2 (100.0)	1 (50.00)	2 (100.0)	2 (100.0)	--	--	--	2 (100.0)	1 (50.00)
Female	--	--	--	--	--	--	--	--	--	--	--	--
Fruits	4	2 (50.00)	4 (100.0)	2 (50.00)	1 (25.00)	1 (25.00)	4 (100.0)	1 (25.00)	1 (25.00)	1 (25.00)	4 (100.0)	2 (50.00)
Male	4	2 (50.00)	4 (100.0)	2 (50.00)	1 (25.00)	1 (25.00)	4 (100.0)	1 (25.00)	1 (25.00)	1 (25.00)	4 (100.0)	2 (50.00)
Female	--	--	--	--	--	--	--	--	--	--	--	--
Total	49	28 (57.14)	49 (100.0)	41 (83.67)	22 (44.90)	37 (75.51)	49 (100.0)	21 (42.86)	24 (42.86)	36 (73.47)	41 (83.67)	31 (63.27)
Male	36	23 (63.89)	38 (100.0)	32 (88.89)	17 (47.22)	25 (69.44)	36 (100.0)	19 (52.78)	19 (52.78)	26 (72.22)	36 (100.0)	23 (63.89)
Female	13	5 (38.46)	13 (100.0)	9 (69.23)	6 (38.46)	12 (92.31)	13 (100.0)	2 (15.38)	2 (15.38)	10 (76.92)	5 (38.46)	8 (61.54)

Note : Figures in brackets indicate percentage.

Source : Based on field data.

XV. EXPECTED INCREASE IN ARRIVALS AFTER MARKET IMPROVEMENT

The analysis carried above points out that (i) market infrastructural facilities are largely absent in the Badaura market and (ii) the farmers/traders of the market want to have facilities at new site proposed by the Badaura gram panchayat by paying market fee. It is being estimated by us that how much increase in arrival of agricultural commodities would result on account of provision of improved facilities in the market.

The analysis as carried in Table-12 shows that the arrival of agricultural commodities is expected to go up by around 91 per cent, that of vegetables by 86 per cent, 133 per cent of foodgrains and 137 per cent of fruits. The increase in arrivals will result on account of increase in present arrival and increase in arrival resulting from the new shops which will increase after the improvement of market.

Table-12: Expected Increase in Arrivals of Agricultural Produce After Market Improvement in the Badaura Market

Commodities	Vegetables	Gur	Fruits	All Agricultural Produce
Number of Sample Shops	43	2	4	49
Total Qty. expected to be sold by sample shops per market day (Kg.)	2394	25	245	2664
Average Qty. expected to be sold by sample shops per market day (kg.)	55.67	12.50	61.25	54.37
Total No. of Shops in the market	150	5	10	165
Total Qty. Expected to be sold per market day in existing shops (kg.)	8350.50	62.50	612.50	8971.05
Expected increase in number of new Shops	22	2	4	28
Expected turnover of new entrants (Kg.)	1224.74	25	245	1522.36
Total expected increase in turnover per market day (kg.)	9575.24	87.50	857.50	10493.41
Actual Qty. sold per market day (kg.)	5143.50	37.50	362.50	5504.40
Percentage Increase	86.16	133.33	136.55	90.64

Source : Based on field data.

XVI. EVALUATION OF ECONOMIC BENEFITS EMANATING FROM MARKET IMPROVEMENTS IN THE BADAURA MARKET

Apart from channelizing fresh agriculture produce from farm level to final consumers there are other economic benefits which are likely to be generated in the process of market improvements. In fact these benefits should be considered as an important factor and as a basis for taking up the task of Rural Market Improvement Programme. There are many economic benefits emanating from improved Rural Market infrastructure. These may broadly be grouped under following categories:

1. As an outcome of market improvements increased volume of trade results in comparatively lower or constant or higher per unit marketing cost.
2. Improved efficiency of market operations in the form of better product display, better facilities and availability of more marketing hours for the buyers and sellers result in higher per unit price of agricultural produce.
3. Reduction in spoilage of perishable crops; vegetables and fruits with the availability of improved rural marketing infrastructure.

It is very logical to put up the idea before a farmer/trader having shop in the market that for availing better market infrastructure they should bear higher market fee. For that matter, the shop owners (traders as well as farmers) have convincingly agreed to pay higher market fee for availing improved market facilities. Besides, additional market fee would also be realized from the new farmers/traders who would join the market after its improvement.

For this matter, it was calculated in the financial analysis (Table-16) that how much market fee is required to be collected after the improvement of market for the viability of market. It was found that for the viability of market, Rs.2/- per shop per market day is required to be collected. If this is taken as a basis of fee collection after the development of Badaura market, a total of Rs.436/- per market day is required to be collected as shown in Table-13.

Table-13 : Potential Market Fee and Increased Market Fee Expected to be paid by Farmers/Traders of Badaura Market

Commodities	No. of Sample Shops at Present	Present Potential of Market Fee of Total Shops (Per Market Day) (Rs.)	Expected Total No. of Shops after Market Improvement (No.)	Total increased market fee required for market improvement (Per Market Day) (Rs.)
Vegetables	150	150	172	344
Gur	5	5	7	14
Fruits	10	10	14	28
Masala	4	4	4	8
Meat and Fish	6	6	6	12
Small eatables	8	8	8	16
Small agricultural implements	4	4	4	8
Bangles	3	3	3	6
Total	190	190	218	436

Source : Based on field data

The table shows that the present fee potential of the market can be estimated to be Rs.190/- per market day on the basis of levying a minimum amount of Re.1/- per shop per market day. The expected increase in the number of shops is estimated to be 218 after market development and for viability, Rs.2/- per shop per market day is to be

collected. The farmers/traders, in the course of discussion, have also expressed their view to pay this much of market fee after the development of the market at new site.

However, due to realization of Rs.2/- per shop per market day, the per unit market cost in the new market would be increased by 33 per cent. The present estimated per unit market cost of the commodities comes to Re.0.03 which will go up to Re.0.04 after market improvement as shown in Table-14.

Table-14 : Change in Marketing Cost Before and After Market Improvement

Commodities	Present Market Turn Over of Sample Shops (Per Market Day) (Kg.)	Total Market Fee Potential of Sample Shops (Per Market Day) (Rs.)	Expected Market Turn-over after market improvement in sample shops (Kg.)	Total Required Collection as Market Fee from Sample Shops (Rs.)	Percentage Increase in Fee Collection after Market Improvement	% Increase in Per Unit Marketing Cost
Vegetables	1474.50	43(0.03)	2394	86(0.04)	100.00	33.33
Gur	15.00	2(0.13)	25	4(0.16)	100.00	23.08
Fruits	1450.00	4(0.03)	245	8(0.03)	100.00	--
All Agricultural Produce	1434.5	49(0.03)	2664	98(0.04)	100.00	33.33

Note : Figures in bracket show per unit marketing cost.

Source : Based on field data

Thus, it becomes evident that after the development of Badaura market, the volume of trade would be increased and per unit cost of sale would also go up. But the increase in fee is not significant in view of increase in the volume of business.

As a result of improved facilities in Badaura market, farmers/traders are expected to maintain the quality of their produce to be sold in the market. In other words, they will be able to bring their produce in this market in a more presentable manner. Buyers will also be satisfied while purchasing the commodities under improved market conditions. Hence, the sellers may justify at least 5 per cent increase in the prices of their produce. As there will not be much real increase in per unit marketing cost, this hike in price would be a net gain to sellers of agricultural produce in Badaura market as the estimate in following Table-15 shows.

Table-15 : Estimation of Net Gain in Marketing Under Market Improvement

Commodities	Estimated Total Value of Commodities sold per market at present (Rs.)	Estimated value of commodities to be sold per market day after market improvement (at current prices) (Rs.)	Estimated value of commodities to be sold after market improvement at 5% higher prices (Rs.)	Net gain per market day (Rs.)	Net gain per annum (Approx.) (Rs.)
Vegetables	12858.75	23938.10	25135.01	1196.91	436872.15
Gur	337.50	787.50	826.88	39.38	14373.70
Fruits	3987.50	9432.50	9904.13	471.63	172144.95
All Agricultural produce	17183.75	34158.10	35866.01	1707.91	623387.15

Source : Based on field data

XVI. FINANCIAL AND ECONOMIC APPRAISAL OF INVESTMENT IN RURAL MARKET OF BADAURA

Introduction

Rural markets are a hub-centre of socio-economic activities in a region. Along with public services such as Primary Health Centre, Veterinary Hospital, Post Office, Bank, Educational Institutions, Play Ground, PCO, Police Station, etc., they provide a fillip to the tempo of social, cultural and economic growth of the region comprising of a number of villages from where buyers and sellers of goods and services are attracted to these markets.

Existing conditions in some such markets are far from satisfactory. A typical market may consist of stalls of a temporary nature and sellers sit on ground and on chabutras of houses and shops, open to sky without any shed or cover. Quite often they are held once, twice or thrice a week during the afternoon hours. Some may be the daily markets also.

The products traded in such markets include vegetables, fruits, flowers, edible oil, spices, jaggery, foodgrains, meat, fish, ready made wears, chappals, sweets, chhats, general goods and services of cobblers, smiths, barbers, etc. Arrival of commodities in the market fluctuates, depending upon the season and other factors.

Catchment area of such rural markets comprises of a large number of smaller and big villages in the vicinity of the village in which the market is held. Total catchment area of such markets may cover a distance of some 6-8 kms. comprising of 10-15 villages or even more.

The following are some of the important infrastructure and public utilities usually required in such markets:

- (1) Pucca open platforms
- (2) Shaded platforms
- (3) Pucca Shops
- (4) Space for Market Information Centre and Office for Market Management Committee
- (5) Room for Security Guard
- (6) Place for parking of cycles, scooters, buggies, horse-carts, tractor-trolleys, etc.
- (7) Storage facility
- (8) Electrification
- (9) Drainage facility
- (10) Boundary wall and Fencing around the haat area with the gates
- (11). Construction of Roads
- (12). Cattle Shed with drinking water facilities
- (13). Drinking wader
- (14). Toilets
- (15). Place for waste disposal
- (16). Plantation of trees

Management of the Market

Quite often the rural market is managed by the Gram Panchayat which realizes 'Tehbazar' from the traders. Another alternative arrangement is that the contract is awarded to a contractor for a stipulated amount per period and the contractor collects

Tehbazari from the shopkeepers at predetermined rates. Gram Panchayat may form a "Market Management Committee" (MMC) to monitor the various activities of the market. The committee may take decisions on the mode of maintenance, management, rate of Tehbazari, method of its realization and settlement of disputes related to the market.

Construction of a market with covered and open pucca platforms, fencing around the area and facilities for storage, toilets, water supply, proper drainage and parking, etc. can bring about an improvement in the conditions in such rural markets. Shopkeepers are willing to pay the 'Tehbazari' at higher rates provided proper facilities are developed.

Financial Analysis of Investment in Infrastructure

Initial investment is required on land and on capital cost involved in the creation of infrastructural facilities described above. Land for rural market could be the land owned by the Gram Panchayat, so that no investment is required to be made on this count.

Upkeep of the infrastructure is a must for the sustainability and trouble-free services. Below we provide estimates of expenditure (both capital and revenue type) required to be made in Badaura market located in Badaura Block of Varanasi District, for which this feasibility study is being carried out (For details of the mathematical approach involved in this, see the Appendix given at the end).

XVII. FINANCIAL ANALYSIS OF PROPOSED

INVESTMENT IN BADOURA MARKET

Here we evaluate financial viability for providing facilities for the improvement of infrastructural facilities and other amenities in the rural market of Badaura. Parameters involved in the financial analysis are detailed below:

1. Initial Capital Investment

Since the Badaura market, at present, lacks infrastructural facilities therefore substantial amount will have to be spent on the modernisation of the market. Platform/sheds need to be constructed, water supply is to be arranged and other infrastructural facilities are to be provided. All this would require capital expenditure. According to our estimate, Rs.9,10,000/- would be needed as initial capital, which will have to be spent over a time span of one year. This may be termed as initial capital investment. We also assume that the entire capital investment will be made instantaneously at the beginning of the year. This is not an unrealistic assumption.

2. Life Span of the Project

The market infrastructural facilities proposed to be provided in the Badaura market would have usefulness for a fairly long period of time though depreciation is bound to take place with the passage of time. The actual life span of the project cannot be estimated with high degree of accuracy but on the basis of technical opinion of the Architect/Civil Engineer, it is assumed that the facilities proposed to be provided would last for a period of at least 15 years. It may not be unrealistic to assume that the

facilities provided would remain useful even for a period of 20 years and above. In case of Badaura market we have taken the life span of the project to be 15 years. Thus, scrap value of the initial infrastructural facilities created at a cost of Rs.9,10,000 has been treated as 30% of the initial capital cost, i.e. Rs.2,73,000.

3. Cost of the Capital

Cost of the capital for project is a critical factor which determines the viability of project. Cost of capital based on the competitive interest rates prevailing in the market would be too high if considered for this market. For socially desirable activities, it is even worthwhile to examine the financial viability at a relatively lower cost of capital. In practice also, the agencies involved in financing socially desirable activities encourage development of infrastructural facilities at a lower rate of capital cost. The projects so financed have plethora of social benefits, apart from financial benefits emanating from the project financed.

Keeping all this in view, 12 per cent annual cost of capital has been considered in the financial analysis of the Badaura Market.

4. Cost of Repair and Maintenance

The proposed facilities to be provided in the market are bound to depreciate over the passage of time. Proper maintenance and upkeep of facilities in good condition is a social as well as economic necessity.

Keeping this objective in view, adequate provision has been made to account for the cost likely to arise on account of repair and maintenance. Items of expenditure under this head are as follows:

- (a) Expenditure on labour, materials and overheads for repair and maintenance of facilities;
- (b) Repair/Replacement of water pumps, electrical equipments and accessories etc. from time to time;
- (c) Salaries and wages payable to persons employed for the upkeep of facilities created by the project.

Details of annual maintenance expenditure are as follows:

1.	Watchman for Security @ Rs.1500 per month	Rs.18,000
2.	Sweeper for cleaning for 365 days @ Rs.40 per day	Rs.14,600
3.	Electrical Maintenance for 365 days @ Rs.100 per day	Rs.36,500
4.	Maintenance of Handpump	Rs. 1,000
<hr/> Total		Rs.70,100
<hr/> The above expenditure is expected to increase @ 5% annually.		

Technical estimates suggest that there would be zero expenditure on repair and maintenance of the project during the first year. It is assumed that during second and third years, 2 per cent of the initial investment would be required for repair and maintenance. During the years 4 to 7, this will be 3% of the initial investment and thereafter @ 5 per cent of the initial capital investment will be needed for repair and maintenance of civil work and other infrastructural facilities till 15th year.

5. Revenues Arising from the Market

The completion of the market improvement programme would result into substantial improvement in the working conditions of the Badaura market. Farmers and traders would get a sizeable and respectable place to sit in and transact the business. They would be saved from the inconvenience arising due to limited space, open sale and bad weather. There is always a good-will value associated with a good looking shop.

As a result of improved facilities in the market, it is expected that on account of availability of improved facilities the users of market would be willing to pay an increased market fee and rent for using these facilities.

Views of farmers/traders were solicited on the required increase in the market fee recoverable from them after market improvement programme is carried out. Incremental increase in revenue due to creation of infrastructural facilities has been put at Rs.1,59,000 in the initial year. This is expected to go up @ 10% per annum.

NPV (Net Present Value) of Investments in the Projects

Based on the assumptions stated above, the sources of cash inflows and outflows are as follows:

Inflows

- (a) Expected increase in revenue (Beginning at Rs.1,59,000 per annum and going up @ 10% per annum)
- (b) Terminal value of initial investment (after 15 years from now) (30% of initial capital cost)

Outflows

(c) Initial capital cost (Rs.9,10,000)

(d) Cost of Repair and Maintenance (Rs.70100 in the initial year and expected to increase @ 5% per annum)

(e) Cost of maintenance of civil work and other infrastructural facilities (2% of capital cost in years 2 and 3, 3% in years 4 to 7, and 5% from years 8 onwards).

**Table 16: Computation of NPV and IRR on the basis of Expected Cash Flows
(Financial Point of View)**

Year	Addl. Revenue Generated (based on increase @ 10% p.a.)	Terminal Value	Initial Capital Cost	Cost of Repair & Maintenance (based on increase @ 5% p.a.)	Rate of Increase in the Maintenance cost of civil work	Cost of Maintenance of Civil Work (based @ 2% of initial investment in years 2&3 and 5% thereafter)	Net Cash Flow
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
0			910000				(910000)
1							0
2	159000			70100	0.02	18200	70700
3	174900			73605	0.02	18200	83095
4	192390			77285	0.03	27300	87805
5	211629			81150	0.03	27300	103179
6	232792			85207	0.03	27300	120285
7	256071			89467	0.03	27300	139304
8	281678			93941	0.05	45750	142237
9	309846			98638	0.05	45500	165708
10	340831			103570	0.05	45500	191761
11	374914			108748	0.05	45500	220666
12	412405			114186	0.05	45500	252720
13	453646			119895	0.05	45500	288251
14	499010			125890	0.05	45500	327621
15	548911	273000		132184	0.05	45500	644227

NPV = 1853; IRR = 12% per annum

Based on a cost of capita of 12%, the NPV of the project is Rs.1853. However, with changes in the cost of capital, the NPV of the project is as follows:

Table 17: Impact of Changes in Cost of Capital on Net Present Value

Cost of Capital	NPV (in Rs.)
0.06	631887
0.08	372602
0.10	166702
0.12	1853
0.14	(131182)
0.15	(188040)
0.16	(239412)

Additional revenue arising due to the proposed investment on infrastructural facilities is expected to be Rs.1,50,000 per annum in the initial year. However, if this falls short of the expectations, NPV becomes negative. In the tables below, the NPV and IRR are given for different amounts of additional revenue generated in the initial year ranging from Rs.150000 to as high as Rs.200000 along with the rates of growth in the revenues ranging from 5% per annum to 20% per annum.

Table 18 : Table Giving NPV at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)						
	150000	159000	170000	180000	190000	200000	
0.05	(442603)	(374315)	(290851)	(214975)	(139100)	(63224)	
0.06	(381245)	(309275)	(221312)	(141346)	(61379)	18587	
0.08	(244830)	(164676)	(66709)	22352	111413	200473	
0.10	(87728)	1853	111340	210875	310409	409943	
0.12	93366	193813	316580	428188	539795	651402	
0.14	302268	415249	553336	678870	804404	929938	
0.15	418498	538453	685063	818346	951629	1084911	
0.20	1143285	1306727	1506488	1688090	1869692	2051294	

Table 19 : Table Giving IRR at Various Levels of Revenues of the Initial Year and Various Rates of Growth

	Revenue of the Initial Year (in Rs.)						
	150000	159000	170000	180000	190000	200000	
Rate of Growth in Revenues	0.05	0.039	0.053	0.070	0.084	0.097	0.110
	0.06	0.054	0.068	0.084	0.097	0.110	0.123
	0.08	0.082	0.095	0.110	0.123	0.136	0.147
	0.10	0.108	0.120	0.135	0.147	0.159	0.171
	0.12	0.132	0.144	0.158	0.170	0.181	0.193
	0.14	0.154	0.166	0.180	0.191	0.203	0.214
	0.15	0.165	0.177	0.190	0.202	0.213	0.224
	0.20	0.217	0.228	0.241	0.252	0.263	0.273

Accumulations in the Sinking Fund

Surpluses of revenues over expenditure can be used for further expansion of facilities in the market and for providing additional facilities to sellers and buyers. These funds can be invested in safe and profitable investment avenues with a view to get a lump sum amount of money which can be used for replacement of infrastructural facilities when they get decayed and outdated. The deposits in the fund are expected to be as follows, depending upon the rate of interest earned on investments:

Table 20: Table giving accumulated value of Deposits made in the Sinking Fund at Different Rates of Interest, as at the end of 15 years

Rate of Interest	Revenue of the Initial Year (Rs. in Lakh)					
	150000	159000	170000	180000	190000	200000
0.08	36.61	40.69	45.42	49.72	54.02	58.32
0.09	38.65	42.76	47.77	52.33	56.89	61.44
0.10	40.63	44.98	50.29	55.13	59.96	64.79
0.11	42.74	47.36	53.00	58.13	63.26	68.39
0.12	45.01	49.91	55.90	61.35	66.80	72.25
0.13	47.44	52.65	59.02	64.81	70.60	76.39
0.14	50.05	55.59	62.37	68.53	74.69	80.85
0.15	52.85	58.75	65.96	72.51	79.07	85.63

ECONOMIC ANALYSIS

The following intangible benefits of the investment are particularly noteworthy:

- (1) Increase in the value of transactions carried out in the market
- (2) Benefits for women
- (3) Technology dissemination and technology development
- (4) Reduction in spoilage
- (5) Dissemination of market intelligence
- (6) Encouragement in the trade of agricultural and horticultural produce

As is quite obvious, if we take into consideration the impact of the above mentioned intangible factors on the NPV or IRR of the project, then investment on infrastructure in a rural market becomes a highly profitable proposition. Detailed calculations incorporating various aspects of social cost benefit analysis have not been carried out.

We have considered in this study the financial dimensions of the project and have gathered information relating to financial viability. Ultimate success of the project would depend on how imaginatively the project is managed in all its aspects. In this regard, sound financial management is of great importance.

There are considerable moral and cultural benefits accruing from the investment. Such investment cannot be looked as an instrument merely for solving the problems of poverty and backwardness. The real contribution of the investment is in terms of enhancing the quality of life of the people in the region. The project would be advantageous from different view points.

Some such non-tangible benefits accruing from investment in the project are detailed below:

(1) Markets are held under unhygienic conditions as at present. Food articles, vegetables are kept under exposed conditions and become carriers of diseases and ailments. The project would create healthy and hygienic conditions and thereby the physical well being of the people would be improved.

- (2) Market is a place of social interaction. It is a venue where people belonging to the region converge for a day or two in a week and buy articles of daily consumption. Improved condition in the market enables people to buy good quality products and thus the quality of life would be improved.
- (3) Political and social reform activities are conducted through these markets. Improved conditions in the market would attract more and more people to come to the market and derive benefits.
- (4) Improved conditions in the market could lead to increased business activities and increased arrival of articles of consumption. More business transactions would be carried out through the market and consequently more employment as well as income generation opportunities would be opened up.
- (5) Consciousness about new products and technology, etc. would be spread through the market. This would lead to improvement in the living standards of people. Companies can launch new products and processes suited for local consumption through these markets.
- (6) Climatic conditions reach extreme level during summer, winter and rainy seasons. Conditions become extremely bad particularly during the rainy season and the arrivals of articles is adversely affected. During summer also, when temperature level reaches high, it becomes very difficult both for the traders as well as the customers to visit the market. During winter season also, chilly winds prevent customers and traders to visit the market. Improved conditions would increase the number of days during which the markets are held.

- (7) When markets are not held regularly or when customers do not arrive in adequate numbers, agricultural produce particularly the perishable vegetables get spoiled or they have to be sold at low price resulting into loss for the producers as well as consumers. Poor and vulnerable sections of the society are particularly harmed on account of poor conditions in the market.
- (8) Improvement in the market would lead to increased economic activity in the region. It would lead to more efficient and effective utilization of the natural as well as man-power resources available in the region.
- (9) Cultural activities would be encouraged through improved working conditions. Social welfare and reform activities can also be carried out more easily by improving the conditions in the market.

In a nutshell, the conditions in the market indicate the level of development of civilization. The investment under consideration is a contribution towards civilizational development and thus carries within it several non-financial and non-economic benefits.

If these are taken into consideration, the true value of NPV and IRR is much higher than has been computed in the study. This is shown in the table below. Here we have added an amount equal to 10% of the incremental trading caused due to generation of infrastructural facilities in the market. Savings caused due to reduction in spoilage @ 2% of the additional trading have also been added.

Table 21 : Computation of NPV and IRR on the basis of Economic Analysis

Cash Flow on the basis of Financial Analysis	Benefits of Increase in Trading	Benefit due to Reduction in Spoilage	Total Cash Flow
70700	62339	12468	145506
83095	65456	13091	161642
87805	68728	13746	170279
103179	72165	14433	189777
120285	75773	15155	211213
139304	79562	15912	234778
142237	83540	16708	242485
165708	87717	17543	270968
191761	92103	18421	302284
220666	96708	19342	336715
252720	10543	20309	374571
288251	106620	20324	416195
327621	1141951	22390	461962
644227	117549	23510	785286
NPV = 569453; IRR = 19.083%			

WORDS OF CAUTION

Financial viability of the project depends primarily on :

- (1). Surplus of Revenue over expenses (Net Cash Flow); and
- (2). The cost of capital.

In the Table-22 given below, we have calculated the requirements of net cash flow based on different life spans of the project ranging between 15 to 40 years and on the basis of cost of capital ranging between 5% to 18% per annum for an initial investment of Rs.9,10,000 on the infrastructural facilities in the market. The results are

quite revealing in the same that if the market fails to generate a minimum revenue as given in the table, the investment would not be financially viable proposition.

Table 22 : Table Giving Equivalent Annual Cost for Different Life Span of the Project at Different Costs of Capital

Cost of Capital (k)	Life of Project (n) (in Years)						
	15	20	25	30	35	40	
0.05	87671	73021	64567	59197	55575	53033	
0.06	93696	79338	71186	66111	62766	60480	
0.08	106315	92686	85248	80833	78081	76313	
0.10	119641	106888	100253	96532	94358	93056	
0.12	133610	121830	116025	112971	111308	110386	
0.15	155626	145383	140776	138593	137533	137011	
0.16	163215	153487	149251	147316	146412	145985	
0.18	178727	170006	166456	164951	164301	164019	

APPENDIXMATHEMATICAL APPROACH INVOLVED IN THE APPRAISAL OF
INVESTMENT ON INFRASTRUCTURE IN A RURAL MARKET

Let the initial investment on the development of infrastructural and public utilities in a market be Rs. 1. It takes about one year to complete the construction of the facilities and these are available for use after a period of one year since construction commences. It is assumed that incremental expenditure on maintenance of the facilities is incurred all at the end of every year and commences from the end of 2 years since construction starts. This same logic holds for incremental revenues also. The gap between incremental revenues and incremental expenditures (i.e. surplus of revenues over expenditures) is assumed to be Rs.X in the beginning (i.e. at the end of 2 years since construction etc. starts) and this increases in real term, @ g per annum. Useful life span of the initial investment is taken to be 14 years with an assumed depreciation @ 5% per annum simple, so that the terminal value of the infrastructural facilities created in the first year would remain to be 30% of the initial investment 1. Cost of capital is assumed to be 'k' per annum.

Based on the above logic,

$$I = \frac{X}{(1+k)(g-k)} \cdot \frac{1 - (1+k)^{15}}{[(1+k)^{15} - 0.30]} \quad X, \text{ and}$$

$$X = \frac{[(1+k)^{15} - 0.30] (1+k)(g-k)}{[(1+k)^{15} \left(\frac{(1+g)^{14}}{(1+k)^{14}} - 1 \right)]} I$$

If k and g are assumed to be 12% and 10% respectively, the above expression becomes

$$I = 10.53 \cdot X \cdot (Bx), \text{ or equivalently}$$

$$X = 0.095 \cdot I \quad (C \cdot I)$$

If cost of capital (k) ranges between 6% to 15% and the growth in surplus (g) ranges between 5% to 20%, the following matrix giving the values of the coefficients involved in the above expression $X = .095 \cdot I$ is generated.

Table 23: Table giving the values of 'C' in the expression $X = C \cdot I$, at different rates of cost of capital and rates of growth

$g = \text{rate of growth in surplus, of revenues over expenditures}$	$k = \text{Cost of capital}$						
	0.0600	0.0800	0.1000	0.1200	0.1400	0.1500	
0.0500	0.0746	0.0900	0.1067	0.1246	0.1437	0.1538	
0.0600	NA	0.0849	0.1009	0.1182	0.1367	0.1465	
0.0800	0.0620	NA	0.0901	0.1061	0.1234	0.1326	
0.1000	0.0546	0.0668	NA	0.0950	0.1110	0.1195	
0.1200	0.0479	0.0589	0.0712	NA	0.0995	0.1074	
0.1400	0.0419	0.0518	0.0629	0.0753	NA	0.0962	
0.1500	0.0392	0.0486	0.0591	0.0709	0.0840	NA	
0.2000	0.0277	0.0348	0.0429	0.0520	0.0624	0.0680	

($X = \text{Surplus of revenue over expenditure required to be generated at the end of year 2}$, $I = \text{Initial capital outlay}$, $C = \text{Coefficient values computed on the basis of the assumptions stated in the model}$)

The above table acts as a ready reckoner to ascertain the amount of surplus of revenues over expenditures required to be generated on annual basis with a constant annual growth rate of 'g' and a given cost of capital 'k' in order to justify (on the grounds of financial viability) the initial investment of Rs.1 in a market. As an example, if initial capital outlay on a market is Rs.10 lakhs, then $.095 \times$ Rs.1000000 = Rs.95000 is the annual surplus of revenues over expenditures which is required to be generated at the end of the initial year (i.e. year 2) in which facilities are made available for use. This should grow annually @ 10% per annum ($g=.10$) in order to make the project viable from financial point of view.

Reciprocals of the values given in the table 21 above, gives the values of B in the expression $I = BX$. Results are as follows:

Table 24: Table giving the values of 'B' in the expression $I = BX$ at different rates of cost of capital and rates of growth

g = rate of growth in surplus of revenues over expenditure	k = Cost of capital						
	0.06	0.08	0.10	0.12	0.14	0.15	
0.05	13.40	11.11	9.38	8.03	6.96	6.50	
0.06	NA	11.77	9.91	8.46	7.31	6.83	
0.08	16.13	NA	11.09	9.42	8.10	7.54	
0.10	18.32	14.98	NA	10.53	9.01	8.37	
0.12	20.88	16.97	14.05	NA	10.05	9.31	
0.14	23.85	19.29	15.89	13.28	NA	10.39	
0.15	25.52	20.58	16.91	14.10	11.91	NA	
0.20	36.04	28.73	23.32	19.21	16.03	14.71	

The above table acts as a ready reckoner to ascertain the maximum amount of capital investment, which should be made on the expectation of a given amount of surpluses of revenues over expenditures. As an example, if it is expected that a surplus of Rs.95000 can be generated in the initial year, then the investment will remain financially viable upto a maximum investment of $Rs.10.53 \times 95000 = Rs.10$ lakhs. An initial investment of an amount less than Rs.10 lakhs, which can generate a surplus of at least Rs.95000 in the initial year, is of course, a good investment proposition. The above result is true for a cost of capital 12% and the annual growth of surplus of revenues over expenditure @ 10% per annum. Other values given in the table are interpreted similarly.

BEERA PATTI RURAL MARKET

BLOCK HARAUJA

DISTRICT VARANASI

I. LOCATION OF THE BEERAPATTI MARKET

Beerapatti is the daily market held in the village Beerapatti. The market is located in Harava block of Varanasi District. From the block headquarter, one has to travel on Bhojubeer-Sindhaura road upto 5 kms. and here is located the Beerapatti village and market.

The market appears to have tremendous growth potential of marketing of local agricultural produce particularly vegetables. It is being held on the sides of road and hence no development is possible at its present site. The gram panchayat, which claims its ownership over this market has proposed a new site for the development of this market. The hinterland of market consists of the following twenty-four (24) villages:

Name of the Village	Distance from the Market (in kms.)
1. Chandipatti	1.00
2. Harishankar Patti	1.00
3. Devnathpur	1.00
4. Kaji Sarai	1.50
5. Garva	1.25
6. Var	1.00
7. Balipur	1.00
8. Amavar	1.00
9. Ramsinghpur	1.25
10. Dhaneshri	1.25

11. Bajhiavari	0.50
12. Mohanpur	0.50
13. Bahoripur	1.00
14. Khanpatti	1.00
15. Saraya	0.50
16. Haraua	2.00
17. Indravar	1.00
18. Madhaipur	1.25
19. Bhagwanpur	1.00
20. Chuppeypur	1.00
21. Pratappatti	1.50
22. Prayagpur	1.50
23. Singapur	1.00
24. Sabhipur	1.00

II. STRUCTURE OF THE MARKET

The enumeration of all shops in a market day in the Beerapatti market by our research team revealed the fact that the structure of this market consists of only 32 shops. Out of this, vegetable shops are 20, fruits 3, meat and fish 4 and sweets 5. The female shop owners are three only and that too in case of vegetables only. Thus, the size of this market is very small as compared to the other rural markets of the district. In Table-1, the structure of Beerapatti market has been presented.

Table-1 : Structure of the Beerapatti Market

COMMODITIES	TOTAL SHOPS			PERCENTAGE OF TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	17 (85.00)	3 (15.00)	20(100.00)	58.63	100.00	62.50
Fruits	3 (100.0)	--	3 (100.00)	10.34	--	9.38
Meat, Fish	4 (100.0)	--	4 (100.00)	13.79	--	12.50
Sweets	5 (100.0)	--	5 (100.00)	17.24	--	15.62
Total	29 (90.63)	3 (9.37)	32 (100.00)	100.00	100.00	100.0

Note : Figures in brackets indicate percentage.

Source: Based on field data.

III. SAMPLE OF THE MARKET

Out of the total 32 shops in market, a sample of 12 shops was selected for detailed analysis. In these 12 shops, 10 are the shops selling vegetables and 2 fruits. The sample of study constituted around 52 per cent of the total shops in the market.

The female participation in this market as seller of different commodities has already been noted to be lower. Keeping this situation in mind, one female shop owner of vegetable was also included in the sample. She was selected on the basis of PRA as she was found to be good in response and discussion. The Table-1.1 shows the sample structure of the market.

Table-1.1 : Sample of the Market

COMMODITIES	SELECTED SAMPLE SHOPS			PERCENTAGE OF SAMPLE SHOPS IN TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	9 (90.00)	1 (10.00)	10 (100.00)	52.94	33.33	50.00
Fruits	2 (100.00)	--	2 (100.00)	66.67	--	66.67
Total	11 (91.77)	1 (8.33)	12 (100.00)	55.00	33.33	52.17

Note : Figures in brackets indicate percentage.

Source: Based on field data.

IV. COMPOSITION OF THE MARKET

It was observed in the market and later became evident from the data that farmers/traders participation in this market is more or less equal. While majority of vegetable sellers are the farmers, the fruits, meat and fish and sweets sellers are mostly the traders. However, the data as presented in Table-2 indicate the fact that Beerapatti market is mainly the market of vegetables brought by the farmers for sale therein.

Table-2: Farmers and Traders Composition in the Beerapatti Market

Commodities	Farmers	Traders	Total
Vegetables	16 (80.00)	4 (20.00)	20 (100.00)
Fruits	1 (33.33)	2 (66.67)	3 (100.00)
Meat, Fish	--	4 (100.00)	4 (100.00)
Sweets	--	5 (100.00)	5 (100.00)
Total	17 (53.13)	15 (46.87)	32 (100.00)

Source : Based on field data.

V. COMPOSITION OF THE SAMPLE

Since the size of this market has been found to be small, the sample selected is also small comprising of 12 farmers/traders. In this small sample, 9 are the farmers and 3 are the traders as shown in Table-3.

Table-3: Farmers and Traders Composition in the Sample of Beerapatti Market

Commodities	Farmers	Traders	Total
Vegetables	8 (80.00)	2 (20.00)	10 (100.00)
Fruits	1 (50.00)	1 (50.00)	2 (100.00)
Total	9 (75.00)	3 (25.00)	12 (100.00)

Source : Based on field data

VI. TURN OVER OF AGRICULTURAL PRODUCE IN BEERAPATTI MARKET

The Beerapatti is a small market where local farmers/traders bring small quantity of their agricultural produce particularly the vegetables for sale. The data collected from the sample shops as shown in Table-4 showed that on an average 30 kgs. of all agricultural brought in the market is being sold per shop per market day. Each shop has been found to be selling 34 kgs. of vegetables and 13 kgs. of fruits. On this basis, total quantity sold by all shops of the market per market day comes to 672 kgs. of vegetables, 39 kgs. of fruits and 711 kgs. of all agricultural commodities.

Table-4: Actual Turn Over of Agricultural Produce in Beerapatti Market

Commodities	No. of Shops in the Sample	Total Qty. Sold per Market Day by Sample Shops (Kg.)	Average Qty. sold per sample shop per market day (Kg.)	No. of Total shops in the market	Total Qty. sold by all shops per market day (Kg.)
Vegetables	10	336	33.60	20	672
Fruits	2	26	13.00	3	39
All Agricultural Produce	12	362	30.17	23	711

Source : Based on field data.

As mentioned earlier that one of the conditions to make feasibility study of any market is that the market should have or expected to have within 4-5 years the annual turn over of 1000 MT of the agricultural produce. On this basis the selection of Beerapatti market is not justified because our estimate as shown in Table-5 reveals that this market has estimated annual turn over of around 260 MT only which included 246 MT of vegetables and 14 MT of fruits. However, the discussion with local people and observing the agricultural growth potential of the area, it is expected that the present arrivals of agricultural produce will go up many folds within 5 years of the development of this market. It is expected, then, that the arrivals of agricultural produce will cross over the limit of 1000 MT.

Table-5 : Annual Turn Over of All Agricultural Produce in the Beerapatti Market

Commodities	Turn Over (MT)
Vegetables	245.28
Fruits	14.24
All Agricultural Produce	259.52

Source : Based on field data.

VII. PERSONS INVOLVED IN BUYING AND SELLING

According to the survey conducted by our research team, it became evident that 21 persons in the sale of vegetables, 3 in fruits, 5 in meat and fish and 10 in sweets are

found to be involved. Thus, a total of 39 persons are estimated to be involved in sale of all commodities in the market. The average person per shop varies between 1-2.

In buying of different commodities, on an average 22 persons per market day per shop have been reported. In this way, it is estimated that 700 persons purchase different commodities from this market per market day. The commodity-wise persons involved in buying and selling in Beerapatti market per market day have been shown in Table-6.

Table-6: Total and Average Number of Persons Involved in Selling and Buying Per Market Day in Beerapatti Market

Commodities	No. of Persons Involved in Selling	Average No. of Persons Involved in Selling	Total No. of Persons Involved in Buying	Average No. of Persons Involved in Buying
Vegetables	21	1.05	480	24
Fruits	3	1.00	60	20
Meat, Fish	5	1.25	40	10
Sweets	10	2.00	120	24
Total	39	1.22	700	22

Source : Based on field data.

VIII. REVENUE POTENTIAL OF THE MARKET

The Beerapatti gram panchayat claims its ownership over the market but it did not impose or collect any fee on the sellers and hence no revenue is obtained at present.

Since the market size, at present, is small, the present revenue potential is also limited. We have tried to assess that how much revenue can be obtained if a minimum of Re.1/- per shop per market day is imposed. According to our estimate Rs.11680/- can be obtained from the sellers of this market per annum. In Table-7 present revenue potential of the Beerapatti market has been estimated.

Table-7 : Present Potential of Market Fee in Beerapatti Market

Commodities	Total Shops	Potential Market Fee per Market Day (Rs.)	Potential Market Fee Per Annum (Rs.)
Vegetables	20	20	7300
Fruits	3	3	1095
Meat, Fish	4	4	1460
Sweets	5	5	1825
Total	32	32	11680

Source : Based on field data.

IX. MODE OF TRANSPORT USED

The farmers/traders of this market bringing the agricultural produce particularly vegetables have been reported to be using only cycle as a means to transport. The respond of the sample farmers/traders revealed that 92 per cent of them use cycle while remaining 8 per cent travel on foot to come to the market. In Table-8, mode of transport used by the farmers/traders of the Beerapatti market has been shown.

Table-8: Farmers/Traders Using Different Mode of Transport to Bring Agricultural Commodities

(No.)

Commodities	Cycle	On Foot	Total
Vegetables	9 (90.00)	1 (10.00)	10 (100.00)
Fruits	2(100.0)	--	2 (100.00)
Total	11 (91.67)	1 (8.33)	12 (100.00)

Note : Figures given in brackets are percentage.

Source : Based on field data.

XI. DISTANCE COVERED TO REACH THE MARKET

As observed earlier that Beerapatti is a small market catering the large number of nearby villages. This observation is further supported by the analysis carried out in Table-9, which revealed that the average distance covered by the farmers/traders to reach this market comes out to be 1.08 km. All the farmers/traders who visit this market come from the distance of less than 3 kms.

Table-9 : Classification of Sample Farmers/Traders According to the Distance Covered to reach the Beerapatti Market

Commodities	No. of Traders/Farmers			(No.) Average Distance Covered (Km.)
	0-1 (km.)	1-3 (km.)	Total	
Vegetables	5 (50.00)	5 (50.00)	10 (100.00)	1.10
Fruits	2 (100.00)	--	2 (100.00)	1.00
Total	7 (58.33)	5 (41.67)	12 (100.00)	1.08

Note : Figures in brackets indicate percentage.

Source: Based on field data.

XII. EXISTING FACILITIES IN THE MARKET

It became evident from the spot observation that Beerapatti market is held on the sides of road. All the marketing facilities have been found to be non-existent except drinking water by hand pump is available. Though there is electricity but it is not being used by farmers/traders of the market.

XII. NEED OF IMPROVED FACILITIES

As observed above, there is no place for the provision of infrastructural facilities in Beerapatti market at present. Therefore, market is to be developed at new sites, having required facilities. All the farmers/traders of this market and gram sabha members are

eager that market should be constructed at new site. All the farmers/traders want to have new market and they are ready to pay reasonable market fee as evident from Table-10.

Table-10 : Need of Improved Marketing Facilities in Beerapatti Market

Commodities	Total No. of Farmers Shop	No. of Farmers Shops requiring improved facilities	No. of farmers willing to pay higher market fee	Total No. of Traders shop	No. of traders shop requiring improved facilities	No. of traders willing to pay higher market fee
Vegetables	8	8 (100.00)	8 (100.00)	2	2 (100.00)	2 (100.00)
Fruits	1	1(100.00)	1(100.00)	1	1(100.00)	1(100.00)
Total	9	9	9	3	3	3

Note : Figures in brackets indicate percentage.

Source : Based on field data.

The Beerapatti Gram Sabha members have reported to us that they had extensive discussion on the shifting of trade at new market and hope to have all shops shifted at new site without any problem. They hope that the new market will come up as a trading centre of local vegetables.

XIII. TYPE OF MARKETING FACILITIES REQUIRED

The infrastructural facilities are absent in the Beerapatti market. The farmers/traders of this market who bring different commodities for sale in market were encouraged to respond on the basis of PRA that what type of facilities they need. The PRA was followed more rigorously in case of female farmers/traders of the market. The responses given by them have been classified and presented in Table-11.

It becomes evident that drinking water, shed, road, electricity and the cycle stand are main facilities reported to be required by the farmers/traders of the market. The female farmers/traders, besides these facilities, also need toilet and place to sit like *chabutara*.

Table-11 : Type of Marketing Infrastructural Facilities Required by the Farmers/Traders of Beerapatti Market

Commodities	Total No. of Farmers/traders	Place	Dri-n-king Water	Shed	Road	Plat-form	Electri-city	Stor-age	Toilet	Perm-anent shop	Cycle stand	Proper drain-age
Vegetables	10	7 (70.00)	10 (100.0)	10 (100.0)	10 (100.0)	5 (50.00)	10 (100.0)	4 (40.00)	3 (40.00)	2 (20.00)	9 (90.00)	6 (60.00)
Male	9	6 (66.67)	9 (100.0)	9 (100.0)	9 (100.0)	5 (55.56)	9 (100.0)	4 (44.44)	3 (33.33)	2 (22.22)	9 (100.0)	6 (66.67)
Female	1	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	-	1 (100.0)	-	1 (100.0)	--	-	--
Fruits	2	1 (50.00)	2 (100.0)	1 (50.00)	2 (100.0)	1 (50.00)	2 (100.0)	--	1 (50.00)	1 (50.00)	2 (100.0)	2 (100.0)
Male	2	1 (50.00)	2 (100.0)	1 (50.00)	2 (100.0)	1 (50.00)	2 (100.0)	--	1 (50.00)	1 (50.00)	2 (100.0)	2 (100.0)
Female	--	--	--	--	--	--	--	--	--	--	--	--
Total	12	8 (66.67)	12 (100.0)	11 (91.67)	12 (100.0)	6 (100.0)	12 (100.0)	4 (33.33)	5 (41.67)	3 (25.00)	11 (91.67)	8 (66.67)
Male	11	7 (63.64)	11 (100.0)	10 (90.91)	11 (100.0)	6 (54.55)	11 (100.0)	4 (36.36)	4 (36.36)	3 (27.27)	11 (100.0)	8 (72.73)
Female	1	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	--	1 (100.0)	--	1 (100.0)	--	--	--

Note : Figures in brackets indicate percentage.

Source : Based on field data.

XIV. EXPECTED INCREASE IN ARRIVALS AFTER MARKET IMPROVEMENT

The above analysis has revealed the fact that (i) market infrastructural facilities are absent in the Beerapatti market, and (ii) the farmers/traders of the market want to have improved facilities by paying reasonable market fee. It has been tried to assess that how much increase in the turn over of agricultural commodities would result on account of development of this market at new site. The analysis has been carried out in Table-12.

The table shows that arrival of all agricultural commodities would be increased by 1035 per cent. This includes 1082 per cent increase in vegetables and 214 per cent increase in the arrivals of fruits. The increase in arrival of all agricultural commodities will result on account of increase in present arrival and increase in the number of new shops which are expected to go up to 159 from the existing shops of 23.

Table-12: Expected Increase in Arrivals of Agricultural Produce After Market Improvement in the Beerapatti Market

Commodities	Vegetables	Fruits	All Agricultural Produce
Number of Sample Shops	10	2	12
Total Qty. expected to be sold by sample shops per market day (kg.)	454	35	489
Average Qty. expected to be sold by sample shops per market day (kg.)	45.40	17.50	40.75
Total No. of Shops in the market	20	3	23
Total Qty. Expected to be sold per market day in existing shops (kg.)	908	52.50	960.50
Expected increase in number of new Shops	155	4	159
Expected turnover of new entrants	7037	70	7107
Total expected increase in turnover per market day (kg.)	7945	122.5	8067.5
Actual Qty. sold per market day (kg.)	672	39	711
Percentage Increase	1082.29	214.10	1034.67

Source : Based on field data.

XV. EVALUATION OF ECONOMIC BENEFITS EMANATING FROM MARKET IMPROVEMENTS IN THE BEERAPATTI MARKET

Apart from channelising fresh agriculture produce from farm level to final consumers there are other economic benefits which are likely to be generated in the process of market improvements. In fact these benefits should be considered as an important factor and as a basis for taking up the task of Rural Market Improvement Programme. There are many economic benefits emanating from improved Rural Market infrastructure. These may broadly be grouped under following categories:

1. As an outcome of market improvements increased volume of agricultural produce results in comparatively lower or constant or higher per unit marketing cost.
- 2.. Improved efficiency of market operations in the form of better product display, better facilities and availability of more marketing hours for the buyers and sellers result in higher per unit price of agricultural produce.
3. Reduction in spoilage of perishable crops; vegetables and fruits with the availability of improved marketing infrastructure.
 - I. It is very logical to put up the idea before a farmer/trader having shop in the market that for availing better market infrastructure they should bear higher market fee. For that matter, the shop owners (traders as well as farmers) have convincingly agreed to pay higher market fee for availing improved market facilities. Besides, additional market fee would also be realized from the new farmers/traders who would join the market after its improvement.

For this matter, it was calculated in the financial analysis (Table 16) that how much market fee needs to be collected after the improvement of market in order to maintain the viability of the market. It was found that for the viability of Beerapatti market, Rs.2/- per shop per market day should be collected. If Rs.2/- per shop per market day is taken as a basis of fee collection after the development of Beerapatti market, a total of Rs.400/- per market day needs to be collected as shown in Table-13.

Table-13 : Potential Market Fee Potential and Increased Market Fee Expected to be paid by Traders/Farmers of Beerapatti Market

Commodity	Total No.of Shops at present	Present Potential of Market Fee (Per Market Day)	Expected Total No. of New Shops After Market Improvement (No.)	Total Increased Market Fee Required for Market Improvements (Per Market Day)
Vegetables	20	20	175	350
Fruits	3	3	7	14
Meat, Flsh	4	4	8	16
Sweets	5	5	10	20
Total	32	32	200	400

Source : Based on field data

The table shows that present fee potential of the market is estimated to only Rs.32/- on the basis of levying a minimum amount of Re.1/- per shop per market day. The expected increase in the number of shops is estimated to be 200 after development of market and considering the viability of market, Rs.2/- per shop per market day is to be collected. The farmers/traders of this market have also expressed their view to pay Rs.2/- per market day after the development of the market at new site.

The levy of Rs.2/- as market fee after the development of this market would increase market fee by 67 per cent from its potential minimum level. The estimated per unit market cost of all agricultural commodities comes to Re.0.03 which will go up to Re.0.05 after market improvement as evident from Table-14.

Table-14 : Change in Marketing Cost Before and After Market Improvement

Commodities	Present Market Turn Over of Sample Shops (Per Market Day) (Kg.)	Total Market Fee Potential of Sample Shops (Per Market Day) (Rs.)	Expected Market Turn-over after market improvement in sample shops (Kg.)	Total Required Collection as Market Fee from Sample Shops (Rs.)	Percentage Increase in Fee Collection after Market Improvement	% Increase in Per Unit Marketing Cost
Vegetables	336	10(0.03)*	454	20(0.04)*	100	33.33
Fruits	26	2(0.08)*	35	4(0.11)*	100	37.50
Total	362	12(0.03)	489	24(0.05)	100	66.67

* Figures in brackets show per unit marketing cost.

Source : Based on field data

Thus, it becomes evident that after the development of Beerapatti market, the volume of turnover of farmers/traders would be increased and the per unit cost of items sold would also go up. But this increase in fee in view of increase in the volume of turnover is not significant.

Hence, as a result of improved market facilities in the Beerapatti market, farmers/traders are expected to maintain the quality of their produce to be sold in the market. In

other words, they will be able to bring their produce in the market in a more presentable manner. Buyers will also feel satisfied while purchasing the commodities under improved market conditions. Therefore, sellers may easily increase the price of commodities at least by 5 per cent. This hike in view of increased volume of business with not much increase in market fee would bring net gains to the sellers in the market. According to the estimate as shown in Table-15, such net gain would be around Rs.4 lakh per annum.

Table-15 : Estimation of Net Gain in Marketing Under Market Improvement

Commodities	Estimated Total Value of Commodities sold per market at present (Rs.)	Estimated value of commodities to be sold per market day after market improvement (at current prices) (Rs.)	Estimated Value of Commodities to be sold after market improvement at 5% high prices (Rs.)	Net gain per market day (Rs.)	Net gain per annum (Approx.) (Rs.)
Vegetables	1680	19862.50	20855.63	993.13	362492.45
Fruits	429	1347.50	1414.88	67.38	24593.70
Total	2109	21210.00	22270.50	1060.50	387086.15

Source : Based on field data

Other indirect economic benefits are also involved in the process of efficient marketing system. A transparent and efficient system, as suggested for Beerapatti market, will reduce the interference of middlemen and brokers in the determination of agriculture and other produce prices in the market. This will result in direct benefit to farmers/traders on account of increased prices. This gain may lead to expansion of agricultural activities resulting in higher production in the catchment area of Beerapatti market.

Erection of marketing infrastructural facilities in Beerapatti market may provide special benefit in the trading of perishable produce like vegetables, fruits and meat. In case of vegetables, fruits and meats, availability of facilities like water shed, light and storage may reduce at least 20 per cent spoilage of arrivals in the Beerapatti market.

Data relating to proportion of vegetables in total market turn over come around 58 per cent in Beerapatti market. It is expected to go higher with the availability of above listed infrastructural facilities. In case of fruits the spoilage rate is found to be over 40 per cent during the peak season in Beerapatti market.

With the availability of water shed and storage the spoilage rate under such conditions may go down to less than 20 per cent. In case of meat and fish marketing, the availability of better infrastructural facilities will reduce the spoilage of these produce to a considerable extent. Apart from this the hygienic conditions will also be maintained with the availability of these facilities in the market. Under the ordinary conditions the spoilage of fruits and meat products is 25 to 35 per cent and it could be reduced to 15 to

10 per cent with the availability of required infrastructural facilities in Beerapatti market of Haraua block.

XVI. FINANCIAL AND ECONOMIC APPRAISAL OF INVESTMENT IN RURAL MARKET OF BEERAPATTI

Introduction

Rural markets are a hub-centre of socio-economic activities in a region. Along with public services such as Primary Health Centre, Veterinary Hospital, Post Office, Bank, Educational Institutions, Play Ground, PCO, Police Station, etc., they provide a fillip to the tempo of social, cultural and economic growth of the region comprising of a number of villages from where buyers and sellers of goods and services are attracted to these markets.

Existing conditions in some such markets are far from satisfactory. A typical market may consist of some 200 stalls of a temporary nature and sellers sit on ground and on chabutras of houses and shops, open to sky without any shed or cover. Quite often they are held once, twice or thrice a week during the afternoon hours. Some may be the daily markets.

The products traded in such markets include vegetables, fruits, edible oil, spices, jaggery, festival goods and services, foodgrains, meat, fish, ready made wears, chappals, sweets, chhats, general goods and services of cobblers, smiths, barbers, etc. Arrival of commodities in the market fluctuates, depending upon the season and other factors.

Catchment area of such rural markets comprises of a large number of smaller and big villages in the vicinity of the village where the market is held. Total catchment area of such markets may cover a distance of some 6-8 kms. comprising of 10-15 villages or even more.

The following are some of the important infrastructure and public utilities usually required in such markets:

- (1). Pucca open platforms
- (2). Shaded platforms
- (3). Pucca Shops
- (4). Space for Market Information Centre and Office for Market Management Committee
- (5). Room for Security Guard
- (6). Place for parking of cycles, scooters, buggies, horse-carts, tractor-trolleys, etc.
- (7). Storage facility
- (8.). Electrification
- (9). Drainage facility
- (10) Boundary wall and Fencing around the haat area with the gates
- (11) Construction of Roads
- (12) Cattle Shed with drinking water facilities
- (13) Drinking wager
- (14) Toilets
- (15) Place for waste disposal
- (16) Plantation of trees

Management of the Market

Quite often the rural market is managed by the Gram Panchayat which realizes 'Tehbazari' from the traders. Another alternative arrangement is that the contract is awarded to a contractor for a stipulated amount per period and the contractor collects Tehbazari from the shopkeepers at predetermined rates. Gram Panchayat may form a "Market Management Committee" (MMC) to monitor the various activities of the market. The committee may take decisions on the mode of maintenance, management, rate of Tehbazari, method of its realization and settlement of disputes related to the market.

Construction of a market with covered and open pucca platforms, fencing around the area and facilities for storage, toilets, water supply, proper drainage and parking, etc. can bring about an improvement in the conditions in such rural markets. Shopkeepers are willing to pay the 'Tehbazari' at higher rates provided proper facilities are developed.

Financial Analysis of Investment in Infrastructure

Initial investment is required on land and on capital cost involved in the creation of infrastructural facilities described above. Land for rural market could be the land owned by the Gram Panchayat, so that no investment is required to be made on this count.

Upkeep of the infrastructure is a must for the sustainability and trouble-free services. Below we provide estimates of expenditure (both capital and revenue type) required to be made in Beerapatti market located in Haraua Block of Varanasi district, for which this feasibility study is being carried out (For details of the mathematical approach involved in this, see the Appendix given at the end).

XVII. FINANCIAL ANALYSIS OF PROPOSED INVESTMENT IN BEERAPATTI MARKET

Here we evaluate financial viability for providing facilities for the improvement of infrastructural facilities and other amenities in the rural market of Beerapatti. Parameters involved in the financial analysis are detailed below:

1. Initial Capital Investment

Since the Beerapatti market, at present, lacks infrastructural facilities therefore substantial amount will have to be spent on the modernisation of the market. Platform/sheds need to be constructed, water supply is to be arranged and other infrastructural facilities are to be provided. All this would require capital expenditure. According to our estimate, Rs.8,00,000/- would be needed as initial capital, which will have to be spent over a time span of one year. This may be termed as initial capital investment. We also assume that the entire capital investment will be made instantaneously at the beginning of the year. This is not an unrealistic assumption.

2. Life Span of the Project

The market infrastructural facilities proposed to be provided in the Beerapatti market would have usefulness for a fairly long period of time though depreciation is bound to take place with the passage of time. The actual life span of the project cannot be estimated with high degree of accuracy but on the basis of technical opinion of the Architect/Civil Engineer, it is assumed that the facilities proposed to be provided would

last for a period of at least 15 years. It may not be unrealistic to assume that the facilities provided would remain useful even for a period of 20 years and above. In case of Beerapatti market, we have taken the life span of the project to be 15 years. Thus, scrap value of the initial infrastructural facilities created at a cost of Rs.8,00,000 has been treated as 30% of the initial capital cost, i.e. Rs.2,40,000.

3. Cost of the Capital

Cost of the capital for project is a critical factor which determines the viability of project. Cost of capital based on the competitive interest rates prevailing in the market would be too high if considered for this market. For socially desirable activities, it is even worthwhile to examine the financial viability at a relatively lower cost of capital. In practice also, the agencies involved in financing socially desirable activities encourage development of infrastructural facilities at a lower rate of capital cost. The projects so financed have plethora of social benefits, apart from financial benefits emanating from the project financed.

Keeping all this in view, 6 per cent annual cost of capital has been considered in the financial analysis of the Beerapatti Market.

4. Cost of Repair and Maintenance

The proposed facilities to be provided in the market are bound to depreciate over the passage of time. Proper maintenance and upkeep of facilities in good condition is a social as well as economic necessity.

Keeping this objective in view, adequate provision has been made to account for the cost likely to arise on account of repair and maintenance. Items of expenditure under this head are as follows:

- (a) Expenditure on labour, materials and overheads for repair and maintenance of facilities;
- (b) Repair/Replacement of water pumps, electrical equipments and accessories etc. from time to time;
- (c) Salaries and wages payable to persons employed for the upkeep of facilities created by the project.

Details of annual maintenance expenditure are as follows:

1. Watchman for Security @ Rs.1500 per month	Rs.18,000
2. Sweeper for cleaning for 365 days @ Rs.40 per day	Rs. 14,600
3. Electrical Maintenance for 365 days @ Rs.100 per day	Rs.36,500
4. Maintenance of Handpump	Rs. 1,000
Total	Rs.70,100

The above expenditure is expected to increase @ 5% annually.

Technical estimates suggest that there would be zero expenditure on repair and maintenance of the project during the first year. It is assumed that during second and third years, 2 per cent of the initial investment would be required for repair and maintenance. During the years 4 to 7, this will be 3% of the initial investment and

thereafter @ 5 per cent of the initial capital investment will be needed for repair and maintenance of civil work and other infrastructural facilities till 15th year.

5. Revenues Arising from the Market

The completion of the market improvement programme would result into substantial improvement in the working conditions of the Beerapatti market. Farmers and traders would get a sizeable and respectable place to sit in and transact the business. They would be saved from the inconvenience arising due to limited space, open sale and bad weather. There is always a good-will value associated with a good looking shop.

As a result of improved facilities in the market it is expected that on account of availability of improved facilities the users of market would be willing to pay an increased market fee and rent for using these facilities.

Views of farmers/traders were solicited on the possible increase in the market fee recoverable from them after market improvement programme is carried out. Incremental increase in revenue due to creation of infrastructural facilities has been put at Rs.1,46,076 in the initial year. This is expected to go up @ 10% per annum.

NPV (Net Present Value) of Investments in the Projects

Based on the assumptions stated above, the sources of cash inflows and outflows are as follows:

Inflows

- (a) Expected increase in revenue (Beginning at Rs.1,46,076 per annum and going up @ 10% per annum)
- (b) Terminal value of initial investment (after 15 years from now) (30% of initial capital cost)

Outflows

- (c) Initial capital cost (Rs.8,00,000)
- (d) Cost of Repair and Maintenance (Rs.70,100 in the initial year and expected to increase @ 5% per annum)
- (e) Cost of maintenance of civil work and other infrastructural facilities (2% of capital cost in years 2 and 3, 3% in years 4 to 7, and 5% from years 8 onwards).

Table 16: Computation of NPV and IRR on the basis of Expected Cash Flows (Financial Point of View)

Year	Addl. Revenue Generated (based on increase @ 10% p a.)	Terminal Value	Initial Capital Cost	Cost of Repair & Maintenance (based on increase @ 5% p a)	Rate of Increase in the Maintenance cost of civil work.	Cost of Maintenance of Civil Work (based @ 2% of initial investment in years 2&3 and 5% thereafter)	Net Cash Flow
(1)	(2)	(3)	(4)	(5)	(6)	(7)	
0			800000				(800000)
1							0
2	146076			70100	0.02	16000	59976
3	160684			73605	0.02	16000	71079
4	176752			77285	0.03	24000	75467
5	194427			81150	0.03	24000	89278
6	213870			85207	0.03	24000	104663
7	235257			89467	0.03	24000	121790
8	258783			93941	0.05	40000	124842
9	284661			98638	0.05	40000	146023
10	313127			103570	0.05	40000	169557
11	344440			108748	0.05	40000	195692
12	378884			114186	0.05	40000	224696
13	416772			119895	0.05	40000	256877
14	458449			125890	0.05	40000	292560
15	504294	240000		132184	0.05	40000	572110
NPV = 0; IRR = 12% per annum							

Based on a cost of capita of 12%, the NPV of the project is zero. However, with changes in the cost of capital the NPV of the project is as follows:

Table 17: Impact of Changes in Cost of Capital on Net Present Value

Cost of Capital	NPV (in Rs.)
.06	557078
.08	327700
.10	145657
.12	--
.14	(117477)
.15	(167646)
.16	(212967)

Additional revenue arising due to the proposed investment on infrastructural facilities is required to be Rs.1,46,076 per annum in the initial year. However, if this falls short of the expectations, NPV becomes negative. In the tables below, the NPV and IRR are given for different amounts of additional revenue generated in the initial year ranging from Rs.140000 to as high as Rs.190000 along with the rates of growth in the revenues ranging from 5% per annum to 20% per annum.

Table 18 : Table Giving NPV at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)					
	140000	146000	160000	170000	180000	190000
0.05	(391695)	(346169)	(239943)	(164067)	(88191)	(12315)
0.06	(334427)	(286447)	(174494)	(94528)	(14561)	65405
0.08	(207107)	(153670)	(28985)	60075	149136	238197
0.10	(60478)	(758)	138590	238125	337659	437193
0.12	108543	175507	331757	443365	554972	666579
0.14	303519	378839	554587	680121	805655	931189
0.15	412000	491969	678565	811848	945130	1078413
0.20	1088467	1197429	1451671	1633273	1814874	1996476

Table 19 : Table Giving IRR at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)						
	140000	146000	160000	170000	180000	190000	
0.05	0.038	0.049	0.073	0.089	0.104	0.118	
0.06	0.054	0.065	0.088	0.103	0.117	0.131	
0.08	0.084	0.094	0.115	0.130	0.143	0.156	
0.10	0.111	0.120	0.140	0.154	0.167	0.180	
0.12	0.135	0.144	0.164	0.177	0.190	0.202	
0.14	0.158	0.167	0.186	0.199	0.212	0.224	
0.15	0.170	0.178	0.197	0.210	0.222	0.234	
0.20	0.222	0.230	0.248	0.261	0.273	0.284	

Accumulations in the Sinking Fund

Surpluses of revenues over expenditure can be used for further expansion of facilities in the market and for providing additional facilities to sellers and buyers. These funds can be invested in safe and profitable investment avenues with a view to get a lump sum amount of money which can be used for replacement of infrastructural facilities when they get decayed and outdated. The deposits in the fund are expected to be as follows, depending upon the rate of interest earned on investments:

Table 20: Table giving accumulated value of Deposits made in the Sinking Fund at Different Rates of Interest, as at the end of 15 years

Rate of Interest	Revenue of the Initial Year (Rs. in Lakh)					
	140000	146000	160000	170000	180000	190000
0.08	33.16	35.74	41.76	46.06	50.36	54.67
0.09	34.80	37.54	43.92	48.48	53.03	57.59
0.10	36.57	39.47	46.23	51.07	55.90	60.73
0.11	38.45	41.53	48.71	53.84	58.97	64.10
0.12	40.48	43.75	51.37	56.82	62.27	67.72
0.13	42.65	46.12	54.23	60.02	65.81	71.60
0.14	44.98	48.67	57.29	63.45	69.61	75.77
0.15	47.47	51.41	60.58	67.14	73.70	80.25

ECONOMIC ANALYSIS

The following intangible benefits of the investment are particularly noteworthy:

- (1) Increase in the value of transactions carried out in the market
- (2) Benefits for women
- (3) Technology dissemination and technology development
- (4) Reduction in spoilage
- (5) Dissemination of market intelligence
- (6) Encouragement in the trade of agricultural and horticultural produce

As is quite obvious, if we take into consideration the impact of the above mentioned intangible factors on the NPV or IRR of the project, then investment on infrastructure in a rural market becomes a highly profitable proposition. Detailed calculations incorporating various aspects of social cost benefit analysis have not been carried out.

We have considered in this study the financial dimensions of the project and have gathered information relating to financial viability. Ultimate success of the project would depend on how imaginatively the project is managed in all its aspects. In this regard, sound financial management is of great importance.

There are considerable moral and cultural benefits accruing from the investment. Such investment cannot be looked as an instrument merely for solving the problems of poverty and backwardness. The real contribution of the investment is in terms of enhancing the quality of life of the people in the region. The project would be advantageous from different view points.

Some such non-tangible benefits accruing from investment in the project are detailed below:

- (1) Markets are held under unhygienic conditions as at present. Food articles, vegetables are kept under exposed conditions and become carriers of diseases and ailments. The project would create healthy and hygienic conditions and thereby the physical well being of the people would be improved.
- (2) Market is a place of social interaction. It is a venue where people belonging to the region converge for a day or two in a week and buy articles of daily consumption. Improved condition in the market enables people to buy good quality products and thus the quality of life would be improved.
- (3) Political and social reform activities are conducted through these markets. Improved conditions in the market would attract more and more people to come to the market and derive benefits.

- (4) Improved conditions in the market could lead to increased business activities and increased arrival of articles of consumption. More business transactions would be carried out through the market and consequently more employment as well as income generation opportunities would be opened up.
- (5) Consciousness about new products and technology, etc. would be spread through the market. This would lead to improvement in the living standards of people. Companies can launch new products and processes suited for local consumption through these markets.
- (6) Climatic conditions reach extreme level during summer, winter and rainy seasons. Conditions become extremely bad particularly during the rainy season and the arrivals of articles is adversely affected. During summer also, when temperature level reaches high, it becomes very difficult both for the traders as well as the customers to visit the market. During winter season also, chilly winds prevent customers and traders to visit the market. Improved conditions would increase the number of days during which the markets are held.
- (7) When markets are not held regularly or when customers do not arrive in adequate numbers, agricultural produce particularly the perishable vegetables get spoiled or they have to be sold at low price resulting into loss for the producers as well as consumers. Poor and vulnerable sections of the society are particularly harmed on account of poor conditions in the market.
- (8) Improvement in the market would lead to increased economic activity in the region. It would lead to more efficient and effective utilization of the natural as well as man-power resources available in the region.

(9) Cultural activities would be encouraged through improved working conditions. Social welfare and reform activities can also be carried out more easily by improving the conditions in the market.

In a nutshell, the conditions in the market indicate the level of development of civilization. The investment under consideration is a contribution towards civilizational development and thus carries within it several non-financial and non-economic benefits.

If these are taken into consideration, the true value of NPV and IRR is much higher than has been computed in the study. This is shown in the table below. Here we have added an amount equal to 10% of the incremental trading caused due to generation of infrastructural facilities in the market. Savings caused due to reduction in spoilage @ 2% of the additional trading have also been added.

Table 21 : Computation of NPV and IRR on the basis of Economic Analysis

Cash Flow on the basis of Financial Analysis	Benefits of Increase in Trading	Benefit due to Reduction in Spoilage	Total Cash Flow
59976	110000	22000	191976
71079	115500	23100	209679
75467	121275	24255	220997
89276	127339	25468	242084
104663	133706	26741	265110
121790	140391	28078	290259
124842	147411	29482	301735
146023	154781	30956	331761
169557	162520	32504	364582
195692	170646	34129	400467
224698	179178	35836	439712
256877	188137	37627	482642
292560	197544	39509	529613
572110	207421	41484	821016
NPV = 1001561; IRR = 25.195%			

WORDS OF CAUTION

Financial viability of the project depends primarily on :

- (1) Surplus of Revenue over expenses (Net Cash Flow); and
- (2) The cost of capital.

In the table below, we have calculated the requirements of net cash flow based on different life spans of the project ranging between 15 to 40 years and on the basis of cost of capital ranging between 5% to 18% per annum for an initial investment of Rs.8 lakh on the infrastructural facilities in the market. The results are quite revealing in the sense that if the market fails to generate a minimum revenue as given in the table, the investment would not be financially viable proposition.

Table 22 : Table Giving Equivalent Annual Cost for Different Life Span of the Project at Different Costs of Capital

Cost of Capital (k)	Life of Project (n) (in Years)					
	15	20	25	30	35	40
0.05	77074	64194	56762	52041	48857	46623
0.06	82370	69748	62581	58119	55179	53169
0.08	93464	81482	74943	71062	68643	67088
0.10	105179	93968	88134	84883	82952	81808
0.12	117459	107103	102000	99315	97853	97043
0.15	136814	127809	123760	121840	120908	120450
0.16	143486	134934	131210	129509	128714	128339
0.18	157122	149456	146335	145011	144440	144192

APPENDIX

MATHEMATICAL APPROACH INVOLVED IN THE APPRAISAL OF INVESTMENT ON INFRASTRUCTURE IN A RURAL MARKET

Let the initial investment on the development of infrastructural and public utilities in a market be Rs. 1. It takes about one year to complete the construction of the facilities and these are available for use after a period of one year since construction commences. It is assumed that incremental expenditure on maintenance of the facilities is incurred all at the end of every year and commences from the end of 2 years since construction starts. This same logic holds for incremental revenues also. The gap between incremental revenues and incremental expenditures (i.e. surplus of revenues over expenditures) is assumed to be Rs.X in the beginning (i.e. at the end of 2 years since construction etc. starts) and this increases in real term, @ g per annum. Useful life span of the initial investment is taken to be 14 years with an assumed depreciation @ 5% per annum simple, so that the terminal value of the infrastructural facilities created in the first year would remain to be 30% of the initial investment 1. Cost of capital is assumed to be 'k' per annum.

Based on the above logic,

$$X = \frac{\frac{1+g}{1+k}^{14} - 1}{(1+k)(g-k)[(1+k)^{15} - 0.30]} X, \quad \text{and}$$

$$X = \frac{[(1+k)^{15} - 0.30] (1+k)(g-k)}{I}$$

$$[(1+k)^{15} \left[\frac{(1+g)^{14}}{(1+k)^{14}} - 1 \right]]$$

If k and g are assumed to be 12% and 10% respectively, the above expression becomes

$$I = 10.53 \cdot X \cdot (Bx), \text{ or equivalently}$$

$$X = 0.095 \cdot I \cdot (C.I)$$

If cost of capital (k) ranges between 6% to 15% and the growth in surplus (g) ranges between 5% to 20%, the following matrix giving the values of the coefficients involved in the above expression $X = .095 \cdot I$ is generated.

Table 23: Table giving the values of 'C' in the expression $X = C \cdot I$, at different rates of cost of capital and rates of growth

g = rate of growth in surplus of revenues over expenditures	k = Cost of capital						
	0.0600	0.0800	0.1000	0.1200	0.1400	0.1500	
0.0500	0.0746	0.0900	0.1067	0.1246	0.1437	0.1538	
0.0600	NA	0.0849	0.1009	0.1182	0.1367	0.1465	
0.0800	0.0620	NA	0.0901	0.1061	0.1234	0.1326	
0.1000	0.0546	0.0668	NA	0.0950	0.1110	0.1195	
0.1200	0.0479	0.0589	0.0712	NA	0.0995	0.1074	
0.1400	0.0419	0.0518	0.0629	0.0753	NA	0.0962	
0.1500	0.0392	0.0486	0.0591	0.0709	0.0840	NA	
0.2000	0.0277	0.0348	0.0429	0.0520	0.0624	0.0680	

(X = Surplus of revenue over expenditure required to be generated at the end of year 2, I = Initial capital outlay, C = Coefficient values computed on the basis of the assumptions stated in the model)

The above table acts as a ready reckoner to ascertain the amount of surplus of revenues over expenditures required to be generated on annual basis with a constant annual growth rate of 'g' and a given cost of capital 'k' in order to justify (on the grounds of financial viability) the initial investment of Rs.1 in a market. As an example, if initial capital outlay on a market is Rs.10 lakhs, then $.095 \times \text{Rs.}1000000 = \text{Rs.}95000$ is the annual surplus of revenues over expenditures which is required to be generated at the end of the initial year (i.e. year 2) in which facilities are made available for use. This should grow annually @ 10% per annum ($g=10$) in order to make the project viable from financial point of view.

Reciprocals of the values given in the table 21 above, gives the values of B in the expression $I = BX$. Results are as follows:

Table 24: Table giving the values of 'B' in the expression $I = BX$ at different rates of cost of capital and rates of growth

$g = \text{rate of growth in surplus of revenues over expenditure}$	$k = \text{Cost of capital}$						
	0.06	0.08	0.10	0.12	0.14	0.15	
0.05	13.40	11.11	9.38	8.03	6.96	6.50	
0.06	NA	11.77	9.91	8.46	7.31	6.83	
0.08	16.13	NA	11.09	9.42	8.10	7.54	
0.10	18.32	14.98	NA	10.53	9.01	8.37	
0.12	20.88	16.97	14.05	NA	10.05	9.31	
0.14	23.85	19.29	15.89	13.28	NA	10.39	
0.15	25.52	20.58	16.91	14.10	11.91	NA	
0.20	36.04	28.73	23.32	19.21	16.03	14.71	

The above table acts as a ready reckoner to ascertain the maximum amount of capital investment, which should be made on the expectation of a given amount of surpluses of revenues over expenditures. As an example, if it is expected that a surplus of Rs.95000 can be generated in the initial year, then the investment will remain financially viable upto a maximum investment of $Rs.10.53 \times 95000 = Rs.10$ lakhs. An initial investment of an amount less than Rs.10 lakhs, which can generate a surplus of at least Rs.95000 in the initial year, is of course, a good investment proposition. The above result is true for a cost of capital 12% and the annual growth of surplus of revenues over expenditure @ 10% per annum. Other values given in the table are interpreted similarly.

KHUTAHAN RURAL MARKET

BLOCK KHUTAHAN

DISTRICT JAUNPUR

I. LOCATION OF THE KHUTAHAN MARKET

Khutahan is the bi-weekly market. Its market days are Wednesday and Saturday. There are two ways to reach this market from Jaunpur district headquarter. One is via Kheta Sarain which is 19 kms. away from Jaunpur. From Kheta Sarain, Khutahan market is located at the distance of 11 kms. on Jaunpur-Khutahan road. The other way is via Malniparao which is 3 kms. away from Jaunpur city. From Malniparao, Khutahan is 31 kms. away on Jaunpur – Khutahan road. This is the old and popular market of this area. The market is being held on the sides of PWD road. Being on the road sides, market infrastructural facilities are non-existent. It is also not possible to develop such facilities at the present site. The Khutahan gram panchayat, which claims its ownership over this market, does not collect any fee from the users of market. However, the Khutahan gram panchayat has shown eagerness in the development of this market on alternative site proposed by its Land Management Committee (LMC). It has sent a proposal to the District Co-ordinator, UPDSAP, Jaunpur via. District Panchayati Raj Officer (DPRO), Jaunpur to develop the market at the new proposed site. The hinterland of this market is large enough to be consisting of the following fifteen (15) main villages within the radius of 6 kms.

Name of the Village	Distance from the Market (in kms.)
1. Sherpur Pathra	4.00
2. Sadanpur	3.00
3. Rasoolpur	5.00
4. Manihar	6.00
5. Pilkicha	0.00

6. Naqvi	1.00
7. Khutahan	1.00
8. Tigra	3.00
9. Panauli	4.00
10. Sayyed Panauli	4.00
11. Shahbuddinpur	3.00
12. Gobaraha	2.00
13. Serapatti	2.00
14. Saurayya	4.00
15. Kairoi	0.50

II. STRUCTURE OF THE MARKET

The complete enumeration of all shops in a market day in the Khutahan market by our research team revealed the fact that the structure of this market comprised of around 306 shops selling different commodities. Among the total shops,, vegetable shops are largest (200) followed by the shops of meat, fish and egg (35), foodgrains and gur (15 shops each) and small number of remaining shops of different commodities as evident from Table 1.

The shops owned by the females are 22 in number which constituted around 7 per cent of the total shops in the market. Out of the total shops of different commodities owned by the females in the market, female participation is found to be largest (16 shops) in vegetables.

Table-1 : Structure of the Kuthahan Market

COMMODITIES	TOTAL SHOPS			PERCENTAGE OF TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	184(92.00)	16(8.00)	200(100.00)	64.79	72.73	65.36
Foodgrains	15(100.00)	--	15(100.00)	5.28	--	4.90
Gur	15(100.00)	--	15(100.00)	5.28	--	4.90
Fruits	5(100.00)	--	5(100.00)	1.76	--	1.63
Masala	3(75.00)	1(25.00)	4(100.00)	1.06	4.55	1.31
Meat, Fish, Egg	35(75.00)	--	35(100.00)	12.32	--	11.44
Small Agriculture Implements	5(100.00)	--	5(100.00)	1.76	--	1.63
Small Eatables	4(80.00)	1(20.00)	5(100.00)	1.41	4.55	1.63
Tobacco	4(100.00)	--	4(100.00)	1.41	--	1.31
Cloths	5(100.00)	--	5(100.00)	1.76	--	1.63
Basket	4(80.00)	1(20.00)	5(100.00)	1.41	4.55	1.63
Shoe maker	2(100.00)	--	2(200.00)	0.70	--	0.65
Pottery	2(100.00)	--	2(100.00)	0.70	--	0.65
Bangle	1(25.00)	3(75.00)	4(100.00)	0.35	13.64	1.31
Total	284(92.81)	22(7.19)	306 (100.00)	100.00	100.00	100.0

Note : Figures in brackets indicate percentage.

Source: Based on field data.

III. SAMPLE OF THE MARKET

It was found in the enumeration of the shops that there are 306 shops in Khutahan market in any market day. Out of these total shops, 72 were selected as sample shops for indepth study. The proportion of sample shops comes to around 24 per cent. It was tried to give proportionate representation in the sample to the shops of males and females as well as of different commodities. In Table 1.1, the sample structure of study has been shown.

Table-1.1 : Sample of the Market

COMMODITIES	SELECTED SAMPLE SHOPS			PERCENTAGE OF SAMPLE SHOPS IN TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	54 (90.00)	6 (10.00)	60 (100.00)	29.35	37.50	30.00
Foodgrains	5 (100.0)	--	5 (100.00)	33.33	--	33.33
Gur	5 (100.0)	--	5 (100.00)	33.33	--	33.33
Fruits	2 (100.0)	--	2 (100.00)	40.00	--	40.00
Total	66 (91.67)	6(8.33)	72(100.00)	30.14	37.50	30.64

Note : Figures in brackets indicate percentage.
Source: Based on field data.

IV. COMPOSITION OF THE MARKET

The Table-2 reveals that the farmers as well as traders bring different commodities for sale in the market. In any of the two market days in a week, i.e. on Wednesday and Saturday, it is estimated that more than half of the sellers of all commodities (58 per cent) are farmers and rest are traders. It reflects from the table that the agricultural commodities are largely brought by the farmers while traders are mostly involved in selling of non-agricultural commodities. Thus, the Khutahan market seems to have the following features:

- (i) It is mainly the market of vegetables of different varieties used in day to day life of the rural people;
- (ii).It is primarily the market of local farmers/traders and buyers.

Table-2: Farmers and Traders Composition in the Khutahan Market

Commodities	Farmers	Traders	Total
Vegetables	146 (73.00)	54(27.00)	200(100.00)
Foodgrains	10(66.67)	5(33.33)	15(100.00)
Gur	10(66.67)	5(33.33)	15(100.00)
Fruits	2(40.00)	3(60.00)	5(100.00)
Masala	--	4(100.00)	4(100.00)
Meat, Fish, Egg	2(5.71)	33(94.29)	35(100.00)
Small Agriculture Implements	--	5(100.00)	5(100.00)
Small Eatables	1(20.00)	4(80.00)	5(100.00)
Tobacco	--	4(100.00)	4(100.00)
Cloths	--	5(100.00)	5(100.00)
Basket	2(40.00)	3(60.00)	5(100.00)
Shoe maker	2(40.00)	--	2(100.00)
Pottery	2(40.00)	--	2(100.00)
Bangle	--	4(100.00)	4(100.00)
Total	177(57.84)	129(42.16)	306(100.00)

Source : Based on field data.

V. COMPOSITION OF THE SAMPLE

Keeping in view the composition of farmers and traders in the structure of this market, more than half of the farmers (72 per cent) and less than half of the total traders (28 per cent) were selected as the sample of study. In case of vegetables, foodgrains, gur and fruits, 75 per cent, 60 per cent, 60 per cent and 50 per cent farmers were included in the sample study respectively. In Table-3, farmers and traders composition in the sample has been presented.

Table-3: Farmers and Traders Composition in the Sample of Khutahan Market

Commodities	Farmers	Traders	Total
Vegetables	45(75.00)	15(25.00)	60(100.00)
Foodgrains	3(60.00)	2(40.00)	5(100.00)
Gur	3(60.00)	2(40.00)	5(100.00)
Fruits	1(50.00)	1(50.00)	2(100.00)
Total	52 (72.22)	20 (27.78)	72 (100.00)

Source : Based on field data

VI. TURN OVER OF AGRICULTURAL PRODUCE IN KHUTAHAN MARKET

The Khutahan market is mainly the market of locally grown agricultural produce particularly vegetables. The data collected from the sample shops shows that on an average 57 kg. of all agricultural produce are sold per shop per market day. Each shop sells 58 kgs. of vegetables, 90 kgs. of foodgrains, 25 kgs of gur and 35 kgs of fruits per market day. On this basis, the total quantity sold by all shops of the market per market day comes to 11514 kgs, 1350 kgs, 375 kgs, 175 kgs and 13414 kgs in respect of vegetables, fruits, gur, fruits and all agricultural produce respectively as reflected from Table-4.

Table-4: Actual Turn Over of Agricultural Produce in Khutahan Market

Commodities	No. of Shops in the Sample	Total Qty. Sold per Market Day by Sample Shops (Kg.)	Average Qty. sold per sample shop per market day (Kg.)	No. of Total shops in the market	Total Qty. sold by all shops per market day (Kg.)
Vegetables	60	3454	57.57	200	11514
Foodgrains	5	450	90.00	15	1350
Gur	5	125	25.00	15	375
Fruits	2	70	35.00	5	175
All Agricultural Produce	72	4099	56.93	235	13414

Source : Based on field data

One of the criterions of selection of haat/painth for feasibility study is that the selected market should have the annual turn over of agricultural produce of more than 1000 MT. The selection of Khutahan market for the feasibility study and its subsequent development is justified because our estimate as shown in Table-5 indicated the fact that this market has estimated annual turnover of around 1395 MT of all agricultural produce. The annual turnover of vegetables in the market has been estimated to be 1197 MT, followed by 140 MT, 39 MT and 18 MT in case of foodgrains, gur and fruits respectively.

Table-5 : Annual Turn Over of All Agricultural Produce in the Khutahan Market

Commodities	Turn Over (MT)
Vegetables	1197.46
Foodgrains	140.40
Gur	39.00
Fruits	18.20
All Agricultural Produce	1395.06

Source : Based on field data

VII. PERSONS INVOLVED IN BUYING AND SELLING

According to innumeration conducted by our research team to count the total number of shops of the Khutahan market on a market day, it becomes evident that there are 306 shops selling different commodities in any market day. The average number of persons found to be involved in selling different items are found to vary between 1-2 persons. On this basis, it has been estimated that in all shops, a total number of 365 persons remain involved in selling. The total number of persons involved in selling of different commodities is related with the number of shops of different commodities.

Since the shop of vegetables are largest in number, therefore, maximum number of 240 persons are estimated to be involved in selling of vegetables.

Table-6: Total and Average Number of Persons Involved in Selling and Buying Per Market Day in Khutahan Market

Commodities	No. of Persons Involved in Selling	Average No. of Persons Involved in Selling	Total No. of Persons Involved in Buying	(No.) Average No. of Persons Involved in Buying
Vegetables	240	1.20	5000	25
Foodgrains	21	1.40	450	30
Gur	15	1.00	285	19
Fruits	5	1.00	95	19
Masala	5	1.25	68	17
Meat, Fish, Egg	40	1.14	525	15
Small Agriculture Implements	5	1.00	40	8
Small Eatables	7	1.40	100	20
Tobacco	4	1.00	88	22
Cloths	5	1.00	50	10
Basket	6	1.20	30	6
Shoe maker	2	1.00	36	18
Pottery	3	1.50	12	6
Bangle	7	1.75	76	19
Total	365	1.19	6855	22

Source : Based on field data.

According to our estimate as shown in Table-6, on an average 22 persons are found to be purchasing from each shop of the market. On this basis, 6855 persons

purchase from all shops on a market day. It can safely be assumed that a person visiting local rural market will make purchase of different items. Since the structure of Khutahan market consists of fourteen commodities group, it is assumed that any person visiting the market on a market day, will purchase ten commodities. On the basis of this assumption which is also based on our observation and discussion with the buyers, it comes out that roughly 1000 persons (both buyers and sellers) come to this market on any market day.

VIII. REVENUE POTENTIAL OF THE MARKET

The Khutahan market is held on the both sides of the Khutahan-Jaunpur road. The Khutahan Gram Panchayat claims its ownership over this market but it did not impose or collect any fee on the sellers and hence no revenue is obtained at present. But this market has emerged as an important market of this area as the number of shops of different commodities and buyers on a market day are quite large. Therefore, the market has good potential of revenue to be obtained. We have tried to assess that how much revenue can be obtained per annum if a minimum amount of Re.1/- is imposed on the sellers of this market. According to our estimate Rs.31824/- can be obtained from the sellers in this market per annum if only Re.1/- per seller is imposed. In Table-7, the revenue potential of the market has been estimated.

Table-7 : Present Potential of Market Fee in Khutahan Market

Commodities	Total Shops	Potential Market Fee per Market Day (Rs.)	Potential Market Fee Per Annum (Rs.)
Vegetables	200	200	20800
Foodgrains	15	15	1560
Gur	15	15	1560
Fruits	5	5	520
Masala	4	4	416
Meat, Fish, Egg	35	35	3640
Small Agriculture Implements	5	5	520
Small Eatables	5	5	520
Tobacco	4	4	416
Cloths	5	5	520
Basket	5	5	520
Shoe maker	2	2	208
Pottery	2	2	208
Bangle	4	4	416
Total	306	306	31824

Source : Based on field data.

IX. MODE OF TRANSPORT USED

The farmers/traders bringing the agricultural produce for sale in Khutahan market have been found to be using three types of transport namely cycle, trolleys, and bus/truck. Some of them also travel to market on foot. Since each farmer/trader brings small quantity for sale in the market, 68 per cent of them have reported to be using cycle as a means of transport. The use of cycle as a means of transport by the farmers/traders of different commodities has been reported to be substantially high. The rickshaw trolleys are being used by the 12 per cent of the farmers and traders and around 11 per cent of them bring their commodities for sale in the market on foot. In

Table-8, the mode of transport used by the farmers/traders of the Khutahan market has been shown.

Table-8: Farmers/Traders Using Different Mode of Transport to Bring Agricultural Commodities

(No.)

Commo-dities	Cycle	Trolleys	Bus/ Truck	On Foot	Total
Vegetables	39(65.00)	7(11.67)	6(10.00)	8(13.33)	60 (100.00)
Foodgrains	4 (80.00)	1(20.00)	--	--	5 (100.00)
Gur	5(100.0)	--	--	--	5 (100.00)
Fruits	1(50.00)	1 (50.00)	--	--	2 (100.00)
Total	49(68.06)	9(12.50)	6(8.33)	8(11.11)	72 (100.00)

Note : Figures given in brackets are percentage.

Source : Based on field data.

X. DISTANCE COVERED TO REACH THE MARKET

As reported earlier that Khutahan rural market is important bi-weekly market of this area and its hinterland extends to around 15 villages. Most of the farmers/traders (around 90 per cent), who bring their commodities for sale in this market come to this market from within the distance of 5 kms. Except 12 per cent of farmers/traders of Vegetables who come to this market from the distance of 5 kms. and above, all others come from the distance of less than 5 kms. The participation of the farmers/traders in this market from adjoining villages appears to be higher, becomes evident further from

the average distance covered by the farmers/traders of different commodities to reach this market as evident from Table-9. The table shows that on an average, farmers/traders travel less than 3 kms. to reach this market to sell their produce. It is further evident that approximate distance of 3 kms. is travelled by the farmers/traders of each of the commodities, viz. vegetables, foodgrains, gur and fruits. All these characteristics point to the fact that the Khutahan market is an important centre of the people residing in large number of nearby villages.

Table-9 : Classification of Sample Farmers/Traders According to the Distance Covered to reach the Khutahan Market

Commodities	Distance Covered Area					(No.) Average Distance Covered (Km.)
	0-1 (km.)	1-3 (km.)	3-5 (km.)	5+ (km.)	Total	
Vegetables	12 (20.00)	23 (38.33)	18 (30.00)	7 (11.67)	60 (100.00)	3.03
Foodgrains	-	3 (60.00)	2 (40.00)	--	5 (100.00)	3.00
Gur	1 (20.00)	2 (40.00)	2 (40.00)	--	5 (100.0)	2.60
Fruits	-	1 (50.00)	1 (50.00)	--	2 (100.00)	3.00
Total	13 (18.06)	29 (40.28)	23 (31.94)	7 (9.72)	72 (100.00)	2.99

Note : Figures in brackets indicate percentage.

Source: Based on field data.

XI. EXISTING FACILITIES IN THE MARKET

It became evident from the spot observation that the Khutahan market is held on the both sides of Khutahan-Jaunpur road. The vital market infrastructural facilities are lacking at present site and only drinking water and electricity are available. But the farmers/traders hardly use electricity.

XII. NEED OF IMPROVED FACILITIES

As explained above, the infrastructural facilities are lacking in Khutahan market. Besides the market being on the road sides, there is no space to develop the facilities. Therefore, market is to be developed at new site, having required facilities and all the sample farmers/traders have expressed their desire to have such facilities as evident from Table-10.

It becomes evident from the table that farmers/traders selling different commodities in the market need improved facilities and all of them are willing to pay higher market fee for using the improved facilities.

Table-10 : Need of Improved Marketing Facilities in Khutahan Market

Commodities	Total No. of Farmers Shop	No. of Farmers Shops requiring improved facilities	No. of farmers willing to pay higher market fee	Total No. of Traders shop	No. of traders shop requiring improved facilities	No. of traders willing to pay higher market fee
Vegetables	45	45(100.00)	45(100.00)	15	15(100.00)	15(100.00)
Foodgrains	3	3(100.00)	3(100.00)	2	2(100.00)	2 (100.00)
Gur	3	3(100.00)	3(100.00)	2	2(100.00)	2(100.00)
Fruits	1	1(100.00)	1(100.00)	1	1(100.00)	1(100.00)
Total	52	52	52	20	20	20

Note : Figures in brackets indicate percentage.

Source : Based on field data

XIII. MARKETING FACILITIES REQUIRED

Since the infrastructural facilities are lacking in the Khutahan market, the farmers/traders who bring different commodities for sale in this market were encouraged

to respond on the basis of PRA that what type of facilities they need. The PRA was applied more rigorously in case of female farmers/traders of the market. The response given by them have been presented in Table-11. It reflects from the table that the facilities namely, drinking water, electricity, shed, proper drinking, drainage, platforms and cycle stand are required by most of the traders. The female farmers/traders need drinking water, toilet, shed, electricity, platform, proper drainage and permanent shops.

Table-11 : Type of Marketing Infrastructural Facilities Required by the Farmers/Traders of Khutaihan Market

Commodities	Total No. of Farmers/traders	Place	Drin-king Water	Shed	Tele-phone	Electri-city	Plat-form	Stor-age	Toilet	Perm- anent shop	Cycle stand	Proper drain-age
Vegetables	60	22 (36.67)	60 (100.0)	54 (100.0)	40 (90.00)	60 (100.0)	43 (71.67)	30 (50.00)	31 (51.67)	28 (46.67)	50 (83.33)	59 (98.33)
Male	54	20 (37.03)	54 (100.0)	50 (100.0)	50 (92.59)	54 (100.0)	40 (74.07)	30 (55.56)	25 (46.30)	25 (46.30)	50 (92.98)	54 (100.0)
Female	6	2 (33.33)	6 (100.0)	4 (100.0)	4 (66.67)	6 (100.0)	3 (50.00)	--	6 (100.0)	3 (50.00)	--	5 (83.33)
Foodgrains	5	2 (40.00)	5 (100.0)	5 (100.0)	2 (40.00)	5 (100.0)	4 (80.00)	5 (100.0)	2 (40.00)	3 (60.00)	3 (60.00)	5 (100.0)
Male	5	2 (40.00)	5 (100.0)	5 (100.0)	2 (40.00)	5 (100.0)	4 (80.00)	5 (100.0)	2 (100.0)	3 (60.00)	3 (60.00)	5 (100.0)
Female	--	--	--	--	--	--	--	--	--	--	--	--
Gur	5	2 (40.00)	5 (100.0)	3 (60.00)	1 (20.00)	5 (100.0)	3 (60.00)	2 (40.00)	2 (40.00)	3 (60.00)	5 (100.0)	5 (100.0)
Male	5	2 (40.00)	5 (100.0)	3 (60.00)	1 (20.00)	5 (100.0)	3 (60.00)	2 (40.00)	2 (100.0)	3 (60.00)	5 (100.0)	5 (100.0)
Female	--	--	--	--	--	--	--	--	--	--	--	--
Fruits	2	1 (50.00)	2 (100.0)	1 (50.00)	--	2 (100.0)	2 (100.0)	1 (50.00)	--	1 (50.00)	1 (50.00)	1 (50.00)
Male	2	1 (50.00)	2 (100.0)	1 (50.00)	--	2 (100.0)	2 (100.0)	1 (50.00)	--	1 (50.00)	1 (50.00)	1 (50.00)
Female	--	--	--	--	--	--	--	--	--	--	--	--
Total	72	27 (37.50)	72 (100.0)	63 (87.50)	43 (59.72)	72 (100.0)	52 (72.22)	38 (52.78)	35 (48.61)	35 (48.61)	59 (81.94)	70 (87.22)
Male	66	25 (37.88)	66 (100.0)	59 (89.39)	43 (65.15)	66 (100.0)	49 (74.24)	38 (57.50)	29 (43.94)	32 (48.48)	59 (89.39)	65 (88.48)
Female	6	2 (33.33)	6 (100.0)	4 (66.67)	--	6 (100.0)	5 (50.00)	--	6 (100.0)	3 (50.00)	--	5 (83.33)

Note : Figures in brackets indicate percentage.

Source : Based on field data.

XIV. EXPECTED INCREASE IN ARRIVALS AFTER MARKET IMPROVEMENT

The above analysis has revealed the fact that (i) market infrastructural facilities are largely absent in the Khutahan market and (ii) the farmers/traders of the market want to have improved facilities by paying market fee. It was attempted to assess that how much increase in turn over of agricultural commodities would result on account of provision of improved infrastructural facilities in the market. The analysis has been carried out in Table-12. It becomes evident that arrivals of all agricultural commodities is expected to go up by 82 per cent, that of foodgrains by 117 per cent, of gur 102 per cent and vegetable by around 76 per cent. The increase in arrivals will result on account of increase in present arrival and increase in the arrivals resulting from the new shops which will be added after market improvement.

Table-12: Expected Increase in Arrivals of Agricultural Produce After Market Improvement in the Khutahan Market

Commodities	Vegetables	Food-grains	Gur	Fruits	All Agricultural Produce
Number of Sample Shops	60	5	5	2	72
Total Qty. expected to be sold by sample shops per market day	5649	815	210	130	68804
Average Qty. expected to be sold by sample shops per market day (kg.)	94.15	163.00	42	65.00	94.50
Total No. of Shops in the market	200	15	15	5	235
Total Qty. Expected to be sold per market day in existing shops (kg.)	18830	2445	630	325	22207.50
Expected increase in number of Shops	15	3	3	3	24
Expected turnover of new entrants	1412.25	489	126	195	2268
Total expected increase in turnover per market day (kg.)	20242.25	2934	756	520	24475.50
Actual Qty. sold per market day (kg.)	11514	1350	375	175	13414
Percentage Increase	75.81	117.33	101.60	197.14	82.46

Source : Based on field data.

XV. EVALUATION OF ECONOMIC BENEFITS EMANATING FROM MARKET IMPROVEMENTS IN THE KHUTAHAN MARKET

Apart from channelizing fresh agriculture produce from farm level to final consumers, there are other economic benefits which are likely to be generated in the process of market improvements. In fact, these benefits should be considered as an important factor and as a basis for taking up the task of Rural Market Improvement Programme. There are many economic benefits emanating from improved Rural Market infrastructure. These may broadly be grouped under following categories:

1. As an outcome of market improvements, the volume of turnover will increase. There is possibility that per unit market fee may also go up but this increase may not affect the net gains in view of increased value of business.
2. Improved efficiency of market operations in the form of better product display, better facilities and availability of more marketing hours for the buyers and sellers result in higher per unit price of agricultural produce.
3. Reduction in spoilage of perishable crops, vegetables and fruits with the availability of improved rural marketing infrastructure.

It is very logical to put up the idea before farmers/traders of the market that for availing better market infrastructural facilities they should pay reasonable market fee. The shop owners have convincingly agreed to pay market fee for availing improved market facilities. Besides, additional market fee would also be realized from the new farmers/traders who would join the market after its improvement.

For this matter, it was calculated in the financial analysis (Table 16) that how much market fee needs to be collected after the improvement of market in order to maintain the market viable. It was found that for the viability of the market, Rs.4.49 per shop per market day need to be collected. If this is taken as a basis of fee collection after the development of Khutahan market, a total of Rs.1490.68 per market day need to be collected as shown commodity-wise in Table-13.

Table-13 : Potential Market Fee and Increased Market Fee Expected to be paid by Traders/Farmers of Khutahan Market

Commodity	Total No. of Shops	Present Potential of Market Fee (Per Market Day)	Expected Total No. of Shops After Market Improvement	Total Increased Market-Fee Required for Market Improvement (Per Market Day) (Rs.)
Vegetables	200	200	215	965.35
Foodgrains	15	15	18	80.82
Gur	15	15	18	80.82
Fruits	5	5	8	36.92
Masala	4	4	4	17.96
Meat, Fish, Egg,	35	35	37	166.13
Small Agricultural Implements	5	5	5	22.45
Small Eatables	5	5	5	22.45
Tobacco	4	4	4	17.96
Cloths	5	5	5	22.45
Basket	5	5	5	22.45
Shoe Maker	2	2	2	8.98
Pottery	2	2	2	8.98
Bangle	4	4	4	17.96
Total	306	306	332	1490.68

Source : Based on field data

The table shows that the present fee potential of the market can be estimated to be Rs.306 per market day on the basis of levying a minimum amount of Re.1/- per shop per market day. The expected increase in the number of shops is estimated to be 332

after market development and if on viability consideration, Rs.4.49 per shop per market day is to be collected. The farmers/traders, in the course of discussion, have also expressed their view to pay this much of market fee after the development of the market at new site.

However, due the payment of Rs.4.49 per shop per market day, the per unit market cost of the commodities sold in the new market by the farmers/traders would increase by 150 per cent. The present estimated per unit market cost of the commodities sold in Khutahan market comes to Re.0.02, which will go up to Rs.0.05 after market improvement as shown in Table-14.

Table-14 : Change in Marketing Cost Before and After Market Improvement

Commodities	Present Market Turn Over of Sample Shops (Per Market Day) (Kg.)	Total Market Fee Potential Sample Shops Per Market Day at Present (Rs.)	Expected Market Turn-over after market improvement in sample shops (Kg.)	Total Required Collection as Market Fee from Sample Shops (Rs.)	Percentage Increase in Fee Collection after Market Improvement	% Increase in Per Unit Marketing Cost
Vegetables	3454	60 (0.02)	5649	269.40(0.05)	349.00	150.00
Foodgrains	450	5 (0.01)	815	22.45(0.03)	349.00	200.00
Gur	125	5 (0.04)	210	22.45(0.11)	349.00	175.00
Fruits	70	2 (0.03)	130	8.98(0.07)	349.00	133.33
All Agricultural Produce	4099	72 (0.02)	6804	323.28(0.05)	349.00	150.00

* Figures in brackets show per unit marketing cost.

Source : Based on field data

Thus, it becomes evident that after the development of Khutahan market the volume of turn over of farmers/traders would be increased and per unit cost of sale

would also go up. But the increase in fee is not significant in view of increase in the volume of business.

As a result of improved marketing facilities and infrastructure in the bi-weekly Khutahan markets, farmers/traders are expected to maintain the quality of their produce to be sold in the market. In other words, they will be able to bring their produce in the market in a more presentable manner. Buyers will also feel more satisfied while purchasing the commodities under improved marketing conditions. Under these conditions sellers of produce may well justify at least 5 per cent increase in the prices of their produce. As there will be no real increase in per unit marketing cost, this hike in price would be a net gain to the sellers of the agricultural produce in the developed market as estimated in the following Table-15.

Table-15 : Estimation of Net Gain in Marketing Under Market Improvement

Commodities	Estimated Total Value of Commodities sold per market at present (Rs.)	Estimated value of commodities to be sold per market day after market improvement (at current prices) (Rs.)	Estimated Value of Commodities to be sold after market improvement 5% high prices (Rs.)	Net gain per market day (Rs.)	Net gain per annum (Approx.) (Rs.)
Vegetables	28785	50605.63	53135.91	2530.28	263149.12
Foodgrains	10125	22005.00	23105.25	1100.25	114426.00
Gur	3375	6804.00	7144.20	340.20	353980.80
Fruits	1925	5720.00	6006.00	286.00	29744.00
Total	44210	85134.63	89391.36	4256.73	442699.92

Source : Based on field data.

Other indirect economic benefits are also involved in the process of efficient marketing system. A transparent and efficient system, as suggested for Khutahan market, will reduce the interference of middlemen and brokers in the determination of agriculture and other produce prices in the market. This will result into the direct benefit to farmers/traders on account of increased prices. This gain may lead to expansion of agricultural activities, resulting in higher production in the hinterland of Khutahan market.

Erection of marketing infrastructural facilities in Khutahan market may provide special benefit in the trading of perishable produce like vegetables, fruits and meat. In case of vegetables, fruits and meats, availability of facilities like water shed, light and storage may reduce at least 20 per cent spoilage of arrivals in the Khutahan market.

Data relating to proportion of vegetables in total market turn over of agricultural produce come around 58 per cent in Khutahan market. It is expected to go higher with the availability of above listed infrastructural facilities. In case of fruits, the spoilage rate is found to be over 40 per cent during the peak season in this market.

With the availability of watershed and storage, the spoilage rate under such conditions may go down to less than 20 per cent. In case of meat and fish marketing, the availability of better infrastructural facilities will reduce the spoilage of these produce to a considerable extent. Apart from this, the hygienic conditions will also be maintained with the availability of these facilities in the market. Under the ordinary conditions the spoilage of fruits and meat products is 25 to 35 per cent and it could be reduced to 15 to 10 per cent with the availability of required infrastructural facilities in Khutahan market.

XVI. FINANCIAL AND ECONOMIC APPRAISAL OF INVESTMENT IN RURAL MARKET OF KHUTAHAN

Introduction

Rural markets are a hub-centre of socio-economic activities in a region. Along with public services such as Primary Health Centre, Veterinary Hospital, Post Office, Bank, Educational Institutions, Play Ground, PCO, Police Station, etc., they provide a fillip to the tempo of social, cultural and economic growth of the region comprising of a number of villages from where buyers and sellers of goods and services are attracted to these markets.

Existing conditions in some such markets are far from satisfactory. A typical market may consist of stalls of a temporary nature and sellers sit on ground and on chabutras of houses and shops, open to sky without any shed or cover. Quite often they are held once, twice or thrice a week during the afternoon hours. Some may be the daily markets also.

The products traded in such markets include vegetables, fruits, flowers, edible oil, spices, jaggery, foodgrains, meat, fish, ready made wears, chappals, sweets, chhats, general goods and services of cobblers, smiths, barbers, etc. Arrival of commodities in the market fluctuates, depending upon the season and other factors.

Catchment area of such rural markets comprises of a large number of smaller and big villages in the vicinity of the village in which the market is held. Total catchment area

of such markets may cover a distance of some 6-8 kms. comprising of 10-15 villages or even more.

The following are some of the important infrastructure and public utilities usually required in such markets:

- (1) Pucca open platforms
- (2) Shaded platforms
- (3) Pucca Shops
- (4) Space for Market Information Centre and Office for Market Management Committee
- (5) Room for Security Guard
- (6) Place for parking of cycles, scooters, buggies, horse-carts, tractor-trolleys, etc.
- (7) Storage facility
- (8) Electrification
- (9) Drainage facility
- (10) Boundary wall and Fencing around the haat area with the gates
- (11) Construction of Roads
- (12) Cattle Shed with drinking water facilities
- (13) Drinking wader
- (14) Toilets
- (15) Place for waste disposal
- (16) Plantation of trees

Management of the Market

Quite often the rural market is managed by the Gram Panchayat which realizes 'Tehbazari' from the traders. Another alternative arrangement is that the contract is awarded to a contractor for a stipulated amount per period and the contractor collects Tehbazari from the shopkeepers at predetermined rates. Gram Panchayat may form a "Market Management Committee" (MMC) to monitor the various activities of the market. The committee may take decisions on the mode of maintenance, management, rate of Tehbazari, method of its realization and settlement of disputes related to the market.

Construction of a market with covered and open pucca platforms, fencing around the area and facilities for storage, toilets, water supply, proper drainage and parking, etc. can bring about an improvement in the conditions in such rural markets. Shopkeepers are willing to pay the 'Tehbazari' at higher rates provided proper facilities are developed.

Financial Analysis of Investment in Infrastructure

Initial investment is required on land and on capital cost involved in the creation of infrastructural facilities described above. Land for rural market could be the land owned by the Gram Panchayat, so that no investment is required to be made on this count.

Upkeep of the infrastructure is a must for the sustainability and trouble-free services. Below we provide estimates of expenditure (both capital and revenue type) required to be made in Khutahan market located in Khutahan Block of Jaunpur District, for which this feasibility study is being carried out (For details of the mathematical approach involved in this, see the Appendix given at the end).

XVII. FINANCIAL ANALYSIS OF PROPOSED INVESTMENT IN KHUTAHAN MARKET

Here we evaluate financial viability for providing facilities for the improvement of infrastructural facilities and other amenities in the rural market of Khutahan. Parameters involved in the financial analysis are detailed below:

1. Initial Capital Investment

Since the Khutahan market, at present, lacks infrastructural facilities therefore substantial amount will have to be spent on the modernisation of the market. Platform/sheds need to be constructed, water supply is to be arranged and other infrastructural facilities are to be provided. All this would require capital expenditure. According to our estimate, Rs.11,10,00/- would be needed as initial capital, which will have to be spent over a time span of one year. This may be termed as initial capital investment. We also assume that the entire capital investment will be made instantaneously at the beginning of the year. This is not an unrealistic assumption.

2. Life Span of the Project

The market infrastructural facilities proposed to be provided in the Khutahan market would have usefulness for a fairly long period of time though depreciation is bound to take place with the passage of time. The actual life span of the project cannot be estimated with high degree of accuracy but on the basis of technical opinion of the

Architect/Civil Engineer, it is assumed that the facilities proposed to be provided would last for a period of at least 15 years. It may not be unrealistic to assume that the facilities provided would remain useful even for a period of 20 years and above. In case of Khutahan market, we have taken the life span of the project to be 15 years. Thus, scrap value of the initial infrastructural facilities created at a cost of Rs.11,10,000 has been treated as 30% of the initial capital cost, i.e. Rs.3,33,000.

3. Cost of the Capital

Cost of the capital for project is a critical factor which determines the viability of project. Cost of capital based on the competitive interest rates prevailing in the market would be too high if considered for this market. For socially desirable activities, it is even worthwhile to examine the financial viability at a relatively lower cost of capital. In practice also, the agencies involved in financing socially desirable activities encourage development of infrastructural facilities at a lower rate of capital cost. The projects so financed have plethora of social benefits, apart from financial benefits emanating from the project financed.

Keeping all this in view, 12 per cent annual cost of capital has been considered in the financial analysis of the Khutahan Market.

4. Cost of Repair and Maintenance

The proposed facilities to be provided in the market are bound to depreciate over the passage of time. Proper maintenance and upkeep of facilities in good condition is a social as well as economic necessity.

Keeping this objective in view, adequate provision has been made to account for the cost likely to arise on account of repair and maintenance. Items of expenditure under this head are as follows:

- (a) Expenditure on labour, materials and overheads for repair and maintenance of facilities;
- (b) Repair/Replacement of water pumps, electrical equipments and accessories etc. from time to time;
- (c) Salaries and wages payable to persons employed for the upkeep of facilities created by the project.

Details of annual maintenance expenditure are as follows:

1.	Watchman for Security @ Rs.1500 per month	Rs.18,000
2.	Sweeper for cleaning for 104 days @ Rs.40 per day	Rs. 4,160
3.	Electrical Maintenance for 104 days @ Rs.100 per day	Rs.10,400
4.	Maintenance of Handpump	Rs. 1,000
<hr/>		
	Total	Rs.33,560
<hr/>		
The above expenditure is expected to increase @ 5% annually.		

Technical estimates suggest that there would be zero expenditure on repair and maintenance of the project during the first year. It is assumed that during second and third years, 2 per cent of the initial investment would be required for repair and maintenance. During the years 4 to 7, this will be 3% of the initial investment and thereafter @ 5 per cent of the initial capital investment will be needed for repair and maintenance of civil work and other infrastructural facilities till 15th year.

5. Revenues Arising from the Market

The completion of the market improvement programme would result into substantial improvement in the working conditions of the Khutahan market. Farmers and traders would get a sizeable and respectable place to sit in and transact the business. They would be saved from the inconvenience arising due to limited space, open sale and bad weather. There is always a good-will value associated with a good looking shop.

As a result of improved facilities in the market it is expected that on account of availability of improved facilities the users of market would be willing to pay an increased market fee and rent for using these facilities.

Views of farmers/traders were solicited on the required increase in the market fee recoverable from them after market improvement programme is carried out. Incremental increase in revenue due to creation of infrastructural facilities has been put at Rs.1,55,000 in the initial year. This is expected to go up @ 10% per annum.

NPV (Net Present Value) of Investments in the Projects

Based on the assumptions stated above, the sources of cash inflows and outflows are as follows:

Inflows

- (a) Expected increase in revenue (Beginning at Rs.1,55,000 per annum and going up @ 10% per annum)
- (b) Terminal value of initial investment (after 15 years from now) (30% of initial capital cost)

Outflows

- (c) Initial capital cost (Rs.11,10,000)
- (d) Cost of Repair and Maintenance (Rs.33560 in the initial year and expected to increase @ 5% per annum)
- (e) Cost of maintenance of civil work and other Infrastructural facilities (2% of capital cost in years 2 and 3, 3% in years 4 to 7, and 5% from years 8 onwards).

Table 16: Computation of NPV and IRR on the basis of Expected Cash Flows (Financial Point of View)

Year	Addl. Revenue Generated (based on increase @ 10% p a)	Terminal Value	Initial Capital Cost	Cost of Repair & Maintenance (based on increase @ 5% p.a.)	Rate of increase in the Maintenance cost of civil work	Cost of Maintenance of Civil Work (based @ 2% of initial investment in years 2&3 and 5% thereafter)	Net Cash Flow
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
0			1110000				(1110000)
1							0
2	155000			33560	0.02	22200	99240
3	170000			35238	0.02	22200	113062
4	187550			37000	0.03	33300	117250
5	206305			38850	0.03	33300	134155
6	226936			40792	0.03	33300	152843
7	249629			42832	0.03	33300	173497
8	274592			44974	0.05	55500	174118
9	302051			47222	0.05	55500	199329
10	332256			49583	0.05	55500	227173
11	365482			52063	0.05	55500	257919
12	402030			54666	0.05	55500	291664
13	442233			57399	0.05	55500	329334
14	486456			60269	0.05	55500	370687
15	535102	333000		63282	0.05	55500	749320

NPV = Rs.8773; IRR = 12% per annum

Based on a cost of capita of 12%, the NPV of the project is Rs.8,773. However, with changes in the cost of capital the NPV of the project is as follows:

Table 17: Impact of Changes in Cost of Capital on Net Present Value

Cost of Capital	NPV (in Rs.)
.06	755528
.08	448919
.10	204787
.12	8773
.14	(149897)
.15	(217855)
.16	(279364)

Additional revenue arising due to the proposed investment on infrastructural facilities is expected to be Rs.1,55,000 per annum in the initial year. However, if this falls short of the expectations, NPV becomes negative. In the Tables-18, the NPV and IRR are given for different amounts of additional revenue generated in the initial year ranging from Rs.150000 to as high as Rs.180000 along with the rates of growth in the revenues ranging from 5% per annum to 20% per annum.

Table 18 : Table Giving NPV at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)						
	150000	155000	160000	165000	170000	175000	
0.05	(395869)	(357931)	(319094)	(282056)	(244118)	(206180)	
0.06	(334511)	(294528)	(254545)	(214562)	(174578)	(134595)	
0.08	(198097)	(153566)	(109036)	(64506)	(19975)	24555	
0.10	(40994)	8773	58540	108307	158074	207841	
0.12	140100	195903	251707	307510	363314	419118	
0.14	349002	411769	474536	537303	600070	662837	
0.15	465232	531873	598514	665156	731797	798438	
0.20	1190019	1280820	1371620	1462421	1553222	1644023	

Table 19 : Table Giving IRR at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)						
	150000	155000	160000	165000	170000	175000	
0.05	0.063	0.069	0.075	0.081	0.086	0.092	
0.06	0.074	0.080	0.086	0.091	0.097	0.102	
0.08	0.095	0.101	0.107	0.112	0.118	0.123	
0.10	0.115	0.121	0.127	0.132	0.137	0.143	
0.12	0.135	0.141	0.146	0.152	0.157	0.162	
0.14	0.154	0.160	0.165	0.170	0.176	0.181	
0.15	0.163	0.169	0.174	0.180	0.185	0.190	
0.20	0.209	0.214	0.220	0.225	0.230	0.235	

Accumulations in the Sinking Fund

Surpluses of revenues over expenditure can be used for further expansion of facilities in the market and for providing additional facilities to sellers and buyers. These funds can be invested in safe and profitable investment avenues with a view

to get a lump sum amount of money which can be used for replacement of infrastructural facilities when they get decayed and outdated. The deposits in the fund are expected to be as follows, depending upon the rate of interest earned on investments:

Table 20: Table giving accumulated value of Deposits made in the Sinking Fund at Different Rates of Interest, as at the end of 15 years

Rate of Interest	Revenue of the Initial Year (Rs. in Lakh)					
	150000	155000	160000	165000	170000	175000
0.08	47.30	49.45	51.60	53.75	55.90	58.05
0.09	49.81	52.09	54.37	56.65	58.93	61.20
0.10	52.51	54.92	57.34	59.76	62.17	64.59
0.11	55.40	57.97	60.53	63.10	65.66	68.22
0.12	58.51	61.24	63.96	66.68	69.41	72.13
0.13	61.86	64.75	67.65	70.54	73.44	76.33
0.14	65.45	68.53	71.61	74.69	77.77	80.85
0.15	69.32	72.59	75.87	79.15	82.43	85.71

ECONOMIC ANALYSIS

The following intangible benefits of the investment are particularly noteworthy:

- (1) Increase in the value of transactions carried out in the market
- (2) Benefits for women
- (3) Technology dissemination and technology development
- (4) Reduction in spoilage
- (5) Dissemination of market intelligence
- (6) Encouragement in the trade of agricultural and horticultural produce

As is quite obvious, if we take into consideration the impact of the above mentioned intangible factors on the NPV or IRR of the project, then investment on infrastructure in a rural market becomes a highly profitable proposition. Detailed calculations incorporating various aspects of social cost benefit analysis have not been carried out.

We have considered in this study the financial dimensions of the project and have gathered information relating to financial viability. Ultimate success of the project would depend on how imaginatively the project is managed in all its aspects. In this regard, sound financial management is of great importance.

There are considerable moral and cultural benefits accruing from the investment. Such investment cannot be looked as an instrument merely for solving the problems of poverty and backwardness. The real contribution of the investment is in terms of enhancing the quality of life of the people in the region. The project would be advantageous from different view points.

Some such non-tangible benefits accruing from investment in the project are detailed below:

- (1) Markets are held under unhygienic conditions as at present. Food articles, vegetables are kept under exposed conditions and become carriers of diseases and ailments. The project would create healthy and hygienic conditions and thereby the physical well being of the people would be improved.
- (2) Market is a place of social interaction. It is a venue where people belonging to the region converge for a day or two in a week and buy articles of daily consumption.

Improved condition in the market enables people to buy good quality products and thus the quality of life would be improved.

- (3) Political and social reform activities are conducted through these markets. Improved conditions in the market would attract more and more people to come to the market and derive benefits.
- (4). Improved conditions in the market could lead to increased business activities and increased arrival of articles of consumption. More business transactions would be carried out through the market and consequently more employment as well as income generation opportunities would be opened up.
- (5). Consciousness about new products and technology, etc. would be spread through the market. This would lead to improvement in the living standards of people. Companies can launch new products and processes suited for local consumption through these markets.
- (6) Climatic conditions reach extreme level during summer, winter and rainy seasons. Conditions become extremely bad particularly during the rainy season and the arrivals of articles is adversely affected. During summer also, when temperature level reaches high, it becomes very difficult both for the traders as well as the customers to visit the market. During winter season also, chilly winds prevent customers and traders to visit the market. Improved conditions would increase the number of days during which the markets are held.
- (7) When markets are not held regularly or when customers do not arrive in adequate numbers, agricultural produce particularly the perishable vegetables get spoiled or

they have to be sold at low price resulting into loss for the producers as well as consumers. Poor and vulnerable sections of the society are particularly harmed on account of poor conditions in the market.

(8) Improvement in the market would lead to increased economic activity in the region. It would lead to more efficient and effective utilization of the natural as well as man-power resources available in the region.

(9) Cultural activities would be encouraged through improved working conditions. Social welfare and reform activities can also be carried out more easily by improving the conditions in the market.

In a nutshell, the conditions in the market indicate the level of development of civilization. The investment under consideration is a contribution towards civilizational development and thus carries within it several non-financial and non-economic benefits.

If these are taken into consideration, the true value of NPV and IRR is much higher than has been computed in the study. This is shown in the table below. Here we have added an amount equal to 10% of the incremental trading caused due to generation of infrastructural facilities in the market. Savings caused due to reduction in spoilage @ 2% of the additional trading have also been added.

Table 21 : Computation of NPV and IRR on the basis of Economic Analysis

Cash Flow on the basis of Financial Analysis	Benefits of Increase in Trading	Benefit due to Reduction in Spoilage	Total Cash Flow
99240	110000	22000	231240
113062	115500	23100	251662
117250	121275	24255	262780
134155	127339	25468	286962
152843	133706	26741	313290
173497	140391	28078	341966
174118	147411	29482	351011
199329	154781	30956	385066
227173	162520	32504	422197
257919	170646	34129	462695
291864	179178	35836	506878
329334	188137	37627	555099
370687	197544	39509	607740
749320	207421	41484	998225
NPV = 1010334; IRR = 22.177%			

WORDS OF CAUTION

Financial viability of the project depends primarily on :

- (7) Surplus of Revenue over expenses (Net Cash Flow); and
- (8) The cost of capital.

In the table-22 given below, we have calculated the requirements of net cash flow based on different life spans of the project ranging between 15 to 40 years and on the basis of cost of capital ranging between 5% to 18% per annum for an initial investment of Rs.11,10,000 on the infrastructural facilities in the market. The results are quite

revealing in the same that if the market fails to generate a minimum revenue as given in the table, the investment would not be financially viable proposition.

Table 22 : Table Giving Equivalent Annual Cost for Different Life Span of the Project at Different Costs of Capital

Cost of Capital (k)	Life of Project (n) (in Years)						
	15	20	25	30	35	40	
0.05	106940	89069	78757	72207	67790	64689	
0.06	114289	96775	86832	80640	76561	73772	
0.08	129681	113056	103983	98598	95242	93085	
0.10	145936	130380	122287	117748	115096	113508	
0.12	162975	148605	141525	137799	135771	134647	
0.15	189829	177335	171716	169053	167760	167124	
0.16	199087	187220	182054	179693	178590	178070	
0.18	218007	207370	203040	202203	200411	200067	

APPENDIX

MATHEMATICAL APPROACH INVOLVED IN THE APPRAISAL OF INVESTMENT ON INFRASTRUCTURE IN A RURAL MARKET

Let the initial investment on the development of infrastructural and public utilities in a market be Rs. 1. It takes about one year to complete the construction of the facilities and these are available for use after a period of one year since construction commences. It is assumed that incremental expenditure on maintenance of the facilities is incurred all at the end of every year and commences from the end of 2 years since construction starts. This same logic holds for incremental revenues also. The gap between incremental revenues and incremental expenditures (i.e. surplus of revenues over expenditures) is assumed to be Rs.X in the beginning (i.e. at the end of 2 years since construction etc. starts) and this increases in real term, @ g per annum. Useful life span of the initial investment is taken to be 14 years with an assumed depreciation @ 5% per annum simple, so that the terminal value of the infrastructural facilities created in the first year would remain to be 30% of the initial investment 1. Cost of capital is assumed to be 'k' per annum.

Based on the above logic,

$$I = \frac{X}{(1+k)(g-k)} \cdot \frac{\frac{1+g}{1+k}^{14} - 1}{[(1+k)^{15} - 0.30]} X, \quad \text{and}$$

$$X = \frac{[(1+k)^{15} - 0.30] (1+k)(g-k)}{[(1+k)^{15} \left(\frac{(1+g)^{14}}{(1+k)^{14}} - 1 \right)]}$$

If k and g are assumed to be 12% and 10% respectively, the above expression becomes

$$I = 10.53 \cdot X \cdot (Bx), \text{ or equivalently}$$

$$X = 0.095 \cdot I \cdot (C \cdot I)$$

If cost of capital (k) ranges between 6% to 15% and the growth in surplus (g) ranges between 5% to 20%, the following matrix giving the values of the coefficients involved in the above expression $X = .095 \cdot I$ is generated.

Table 23: Table giving the values of 'C' in the expression $X = C \cdot I$, at different rates of cost of capital and rates of growth

		$k = \text{Cost of capital}$					
		0.0600	0.0800	0.1000	0.1200	0.1400	0.1500
$g = \text{rate of growth in surplus of revenues over expenditures}$	0.0500	0.0746	0.0900	0.1067	0.1246	0.1437	0.1538
	0.0600	NA	0.0849	0.1009	0.1182	0.1367	0.1465
	0.0800	0.0620	NA	0.0901	0.1061	0.1234	0.1326
	0.1000	0.0546	0.0668	NA	0.0950	0.1110	0.1195
	0.1200	0.0479	0.0589	0.0712	NA	0.0995	0.1074
	0.1400	0.0419	0.0518	0.0629	0.0753	NA	0.0962
	0.1500	0.0392	0.0486	0.0591	0.0709	0.0840	NA
	0.2000	0.0277	0.0348	0.0429	0.0520	0.0624	0.0680

($X = \text{Surplus of revenue over expenditure required to be generated at the end of year 2}$, $I = \text{Initial capital outlay}$, $C = \text{Coefficient values computed on the basis of the assumptions stated in the model}$)

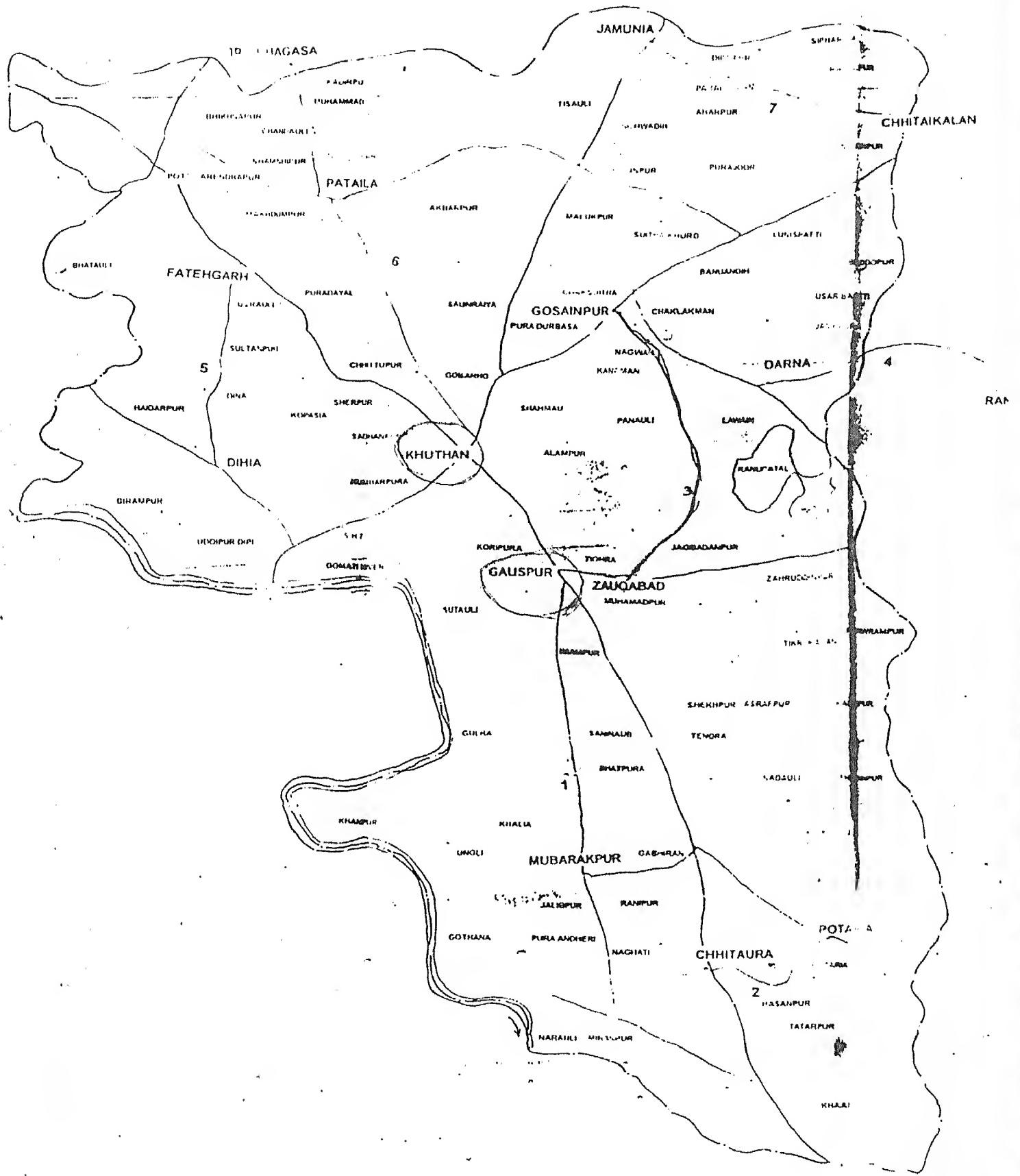
The above table acts as a ready reckoner to ascertain the amount of surplus of revenues over expenditures required to be generated on annual basis with a constant annual growth rate of 'g' and a given cost of capital 'k' in order to justify (on the grounds of financial viability) the initial investment of Rs.1 in a market. As an example, if initial capital outlay on a market is Rs.10 lakhs, then $.095 \times$ Rs.1000000 = Rs.95000 is the annual surplus of revenues over expenditures which is required to be generated at the end of the initial year (i.e. year 2) in which facilities are made available for use. This should grow annually @ 10% per annum ($g=.10$) in order to make the project viable from financial point of view.

Reciprocals of the values given in the table 21 above, gives the values of B in the expression $I = BX$. Results are as follows:

Table 24: Table giving the values of 'B' in the expression $I = BX$ at different rates of cost of capital and rates of growth

g = rate of growth in surplus of revenues over expenditure	k = Cost of capital						
	0.06	0.08	0.10	0.12	0.14	0.15	
0.05	13.40	11.11	9.38	8.03	6.96	6.50	
0.06	NA	11.77	9.91	8.46	7.31	6.83	
0.08	16.13	NA	11.09	9.42	8.10	7.54	
0.10	18.32	14.98	NA	10.53	9.01	8.37	
0.12	20.88	16.97	14.05	NA	10.05	9.31	
0.14	23.85	19.29	15.89	13.28	NA	10.39	
0.15	25.52	20.58	16.91	14.10	11.91	NA	
0.20	36.04	28.73	23.32	19.21	16.03	14.71	

The above table acts as a ready reckoner to ascertain the maximum amount of capital investment, which should be made on the expectation of a given amount of surpluses of revenues over expenditures. As an example, if it is expected that a surplus of Rs.95000 can be generated in the initial year, then the investment will remain financially viable upto a maximum investment of $Rs.10.53 \times 95000 = Rs.10$ lakhs. An initial investment of an amount less than Rs.10 lakhs, which can generate a surplus of at least Rs.95000 in the initial year, is of course, a good investment proposition. The above result is true for a cost of capital 12% and the annual growth of surplus of revenues over expenditure @ 10% per annum. Other values given in the table are interpreted similarly.



BLOCK : KHUTAHAN
DISTRICT : JAUNPUR

**GAUSPUR RURAL MARKET
BLOCK DHARMAPUR
DISTRICT JAUNPUR**

I. LOCATION OF THE GAUSPUR MARKET

Gauspur rural haat is a bi-weekly market, held at the Gauspur village on Monday and Thursday of each week. The market is 32 kms. away from Jaunpur district headquarter. For reaching the village Gauspur, one will have to cover about 29 kms. on Jaunpur-Shahganj highway. Thereafter on a left turn leading to Imampur Link road. The village Gauspur is located at the third kilometre on the left side of this link road. The village and market of Gauspur coming in Khutahan block is hardly at the distance of 3 kms. from block office on Imampur link road. The market is being held on the sides of road, which is in a very dilapidated condition. However, this road is proposed to be reconstructed under UPDASP programme. It is said that the market of Gauspur is as old as 200 years. Despite the market being held on the sides of road, it is owned by the Gram Panchayat.

The revenue collected from traders and farmers of the market is being deposited to the Khutahan Gram Panchayat. At its present location any kind of improvement for better market infrastructural facilities is very difficult. The detailed location of the existing market and alternative site have been indicated in the enclosed map. The hinterland of Gauspur rural market is quite large which consists of following seventeen (17) villages:

Name of the Village	Distance from the Market (in km.)
1. Shekhoopur	1.00
2. Khutahan	3.00
3. Imampur	1.00

4. Tigra	1.00
5. Biri	3.00
6. Badanpur	4.00
7. Bajedhia	3.00
8. Gulra	3.00
9. Sutauli	4.00
10. Shekh Asrakhpur	3.00
11. Naseeb Sarai	1.00
12. Sanjarpur	2.00
13. Tajupur	3.00
14. Harahat	3.00
15. Joukabad	4.00
16. Jamaldeipur	3.00
17. Panauli	4.00

II. STRUCTURE OF THE MARKET

The field visits to the market for data collection and in-depth discussion with the Gauspur village pradhan and other knowledgeable persons of this area revealed that the structure of Gauspur rural haat consists of about 254 shops of farmers/traders in any normal market day. Among the total shops of different commodities vegetable shops are largest (100), followed by the foodgrain shops (30), Gur (20), meat and fish (20), fruits (8), Mustard Oil (5) and miscellaneous shops of other eatables (12), cloths (15), baskets

(11), bangles (10) and clay pots (4), etc. Apart from these shops containing consumer goods, some more shops for providing services of barbering and shoe making (10) are also found available in the market of Gauspur on market days.

Out of total shops in the market, 16.93 per cent are owned by females. The shops dealing in fruits and vegetables in the market are found to be owned by 25 per cent and 10 per cent females respectively. In case of foodgrains trading in the market none of the females owned this shops. However, in case of Mustard Oil and basket shops 100 per cent shops are found to be owned only by females in the rural market of Gauspur. The commodity-wise total number of shops owned by males and females with their respective percentage share are shown in Table 1. The sample selection for the study constitutes more than 36 per cent as shown in Table-1.1.

Table-1 : Structure of the Gauspur Market

COMMODITIES	TOTAL SHOPS			PERCENTAGE OF TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	90(90.00)	10(10.00)	100(100.00)	42.65	23.26	39.37
Foodgrains	30(100.0)	--	30(100.00)	14.22	--	11.81
Mustard Oil	--	05(100.0)	05(100.00)	--	11.63	1.97
Gur	20(100.0)	--	20(100.00)	9.48	--	7.87
Fruits	06(75.00)	02(25.00)	08(100.00)	2.84	4.65	3.15
Betal shop	02(100.0)	--	02(100.00)	0.95	--	0.79
Baskets shop	--	11(100.0)	11(100.00)	--	25.58	
Shoe Maker (Cobbler)	03(100.0)	--	03(100.00)	1.42	--	1.18
Footwear Shops	02(100.0)	--	02(100.00)	0.95	--	0.79
Meat & Fish	20(100.0)	--	20(100.00)	9.48	--	7.87
Bangles	02(20.00)	08(80.00)	10(100.00)	0.95	18.60	3.94
Small Agricultural Implements	05(100.0)	--	05(100.00)	2.37	--	1.97
Small Eatables	12(100.0)	--	12(100.00)	5.69	--	4.72
Cloths	10(66.67)	05(33.33)	15(100.00)	4.74	11.63	5.91
Clay Pots	02(50.00)	02(50.00)	04(100.00)	0.95	4.65	1.57
Barber	07(100.0)	--	07(100.00)	3.32	--	2.75
Total	211(83.07)	43(16.93)	254(100.00)	100.00	100.00	100.0

Note : Figures in brackets indicate percentage

Source: Based on field data

Table-1.1 : Sample of the Market

COMMODITIES	SELECTED SAMPLE SHOPS			PERCENTAGE OF SAMPLE SHOPS IN TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	32 (91.43)	03(8.57)	35(100.00)	35.55	30.00	35.00
Foodgrains	11 (100.00)	--	11(100.00)	36.67	--	36.67
Gur	08 (100.00)	--	08(100.00)	40.00	--	40.00
Fruits	01 (50.00)	01(50.00)	02(100.00)	16.67	50.00	25.00
Mustard Oil	--	03(100.00)	03(100.00)	--	60.00	60.00
Total	52(88.14)	07(11.86)	59(100.00)	35.62	41.18	36.20

Note : Figures in brackets indicate percentage

Source: Based on field data

III. COMPOSITION OF THE MARKET

As shown in Table-2, the farmers and traders bring different commodities for sale in rural market of Gauspur. In each of the weekly market days it is found that among all the sellers of goods and services, more than half of them are the farmers (55.91 per cent) and less than half (44.09 per cent) are the traders. Out of total vegetable shops, 78 per cent belonged to farmers and rest of 22 per cent to traders. In case of foodgrains also 60 per cent shops belonged to farmers coming from villages located in market hinterland and remaining 40 per cent shops are owned by local traders. The other agricultural produce like Mustard Oil, gur and fruits are found to be sold mainly by farmers as indicated in Table 2. Thus, all agricultural commodities as listed above, are sold largely by farmers. This phenomenon is indicative of the fact that Gauspur rural market has three distinct features:

1. The Gauspur rural market is local agricultural based bi-weekly market.
2. This is primarily a market of vegetables, particularly cauliflower and peas.
3. Majority of market activities are run by local farmers.

Table-2: Farmers and Traders Composition in the Gauspur Market

Commodities	Farmers	Traders	Total
Vegetables	78(78.00)	22(22.00)	100(100.00)
Foodgrains	18(60.00)	12(40.00)	30(100.00)
Mustard Oil	05(100.0)	--	05(100.00)
Gur	17(85.00)	03(15.00)	20(100.00)
Fruits	05(62.50)	03(37.50)	08(100.00)
Betal shop	--	02(100.00)	02(100.00)
Barbar	--	07(100.00)	07(100.00)
Shoe Maker (Cobbler)	--	03(100.00)	03(100.00)
Footwear Shops	--	02(100.00)	02(100.00)
Meat & Fish	--	20(100.00)	20(100.00)
Bangles	--	10(100.00)	10(100.00)
Small agricultural Implements	--	05(100.00)	05(100.00)
Small Eatables	04(33.33)	08(66.66)	12(100.00)
Cloths	--	15(100.00)	15(100.00)
Baskets	11(100.0)	--	11(100.00)
Soop	08(100.0)	--	08(100.00)
Clay Pots	04(100.0)	--	04(100.00)
Total	142(55.91)	112(44.09)	254(100.00)

Source : Based on field data

IV. COMPOSITION OF THE SAMPLE

Considering the existing share of total farmers and traders in selling of different agricultural produce in Gauspur rural market, the sample covers 76.27 per cent farmers and 23.73 per cent traders in the sample of study. In case of vegetables, foodgrains, gur, fruits and mustard oil 80 per cent, 54.54 per cent, 87.50 per cent, 50 per cent and 100 per cent farmers are selected in sample in each of the respective produce. In each

category of agricultural produce listed above, the percentage of traders in the sample varied from 12.50 per cent to 50 per cent in case of Gur and fruits respectively. The percentage of traders in the sample is found to be 20 per cent and 45.45 per cent in case of vegetable and foodgrains as shown in Table-3.

Table-3: Farmers and Traders Composition in the Sample of Gauspur Market

Commodities	Farmers	Traders	Total
Vegetables	28 (80.00)	07 (20.00)	35 (100.00)
Foodgrains	06 (54.54)	05 (45.45)	11 (100.00)
Gur	07 (87.50)	01 (12.50)	08 (100.00)
Fruits	01 (50.00)	01 (50.00)	02 (100.00)
Mustard Oil	03 (100.00)	--	03 (100.00)
Total	45 (76.27)	14 (23.73)	59 (100.00)

Source : Based on field data.

V. TURN OVER OF AGRICULTURAL PRODUCE IN GAUSPUR MARKET

The structure of Gauspur rural market indicate that this is primarily a market of agricultural commodities produced in the villages of market hinterland. The structure of Gauspur rural market shows that out of total 254 shops involved in the sale of different commodities the share of shops dealing in agricultural commodities (164) comes more than 64 per cent. The vegetables commanded major share followed by foodgrains,

fruits, gur, mustard oil. The data collected from the sample shops showed that on an average 60 kgs. of vegetables were sold by each vegetable shops followed by 93 kgs. foodgrains per shop, 24 kgs. gur per shop, 75 kgs. fruits per shop. On the basis of this, the total quantity sold by all shops per market day come to 6017 kgs., 2801 kgs., 487 kgs., 600 kgs. and 108 kgs. in respect of vegetables, foodgrains, gur, fruits and mustard oil respectively as is evident from Table-4.

Table-4: Actual Turn Over of Agricultural Produce of Gauspur Market

Commodities	No. of Shops in the Sample	Total Qty. Sold per Market Day by Sample Shops (Kg.)	Average Qty. sold by sample shops (Kg.)	No. of Total shops in the market	Total Qty. sold by all shops per market day (Kg.)
Vegetables	35	2106	60.17	100	6017.00
Foodgrains	11	1027	93.36	30	2800.90
Gur	08	195	24.37	20	487.40
Fruits	02	150	75.00	08	600.00
Mustard Oil	03	65	21.67	05	108.35
All Agricultural Produce	59	3543	60.05	163	9788.29

Source : Based on field data

One of the criterions of selection of rural haat/painth for feasibility study is that while selecting the market it should be insured that either market turnover is more than 1000 MT per annum of all agricultural commodities or market has the potential to attain this target in coming days. The first part of this pre-condition of market selection is justified in case of the Gauspur rural market because our estimates as shown in Table-5

based on primary data collected from sample farmers/traders selling their produce in this market indicated that market has annual turn over of around 1018 MT of all agricultural produce. The annual turn over of vegetables has been estimated to be 626 MT followed by 291 MT of foodgrains, 62 MT of fruits, 51 MT of Gur and 11 MT of Mustard Oil.

Table-5 : Annual Turn Over of All Agricultural Produce in the Gauspur Market

Commodities	Turn Over (MT)
Vegetables	626.77
Foodgrains	291.29
Gur	50.69
Fruits	11.27
Mustard Oil	62.40
All Agricultural Produce	1017.98

Source : Based on field data.

VI. PERSONS INVOLVED IN BUYING AND SELLING

As per our observation and data collection, there are 254 shops of different commodities per market day in Gauspur rural market. The average number of persons seen to be engaged in selling is found to be more or less same (around one person) in case of agricultural commodities, while in the sale of non-agricultural items, average involvement is found to be comparatively higher as shown in Table-6. It is further

revealed through Table-6 that on an average 20 persons purchase from each shop of the market in a single market day. In case of vegetables, foodgrains, Mustard Oil and fruits average involvement per shop is found to be 25 persons, 27 persons, 23 persons and 20 persons in respective order. At the same time in case of non-agricultural communities, lesser number of persons made purchases from each shop. In total, 5054 persons are estimated to be involved in buying of different commodities per market day. Considering the element of multiple buying, in real terms around 2500 persons transact on a single market day in Gauspur market. Apart from this, about 300 persons are found to be engaged in selling their produce in the market. Thus, total of around 2800 to 3000 persons are estimated to be present in a normal market day in the Gauspur rural market.

Table-6: Total and Average Number of Persons Involved in Selling Per Market Day and Buying in Gauspur Market

(No.)

Commodities	No. of Persons Involved in Selling	Average No. of Persons Involved in Selling	Total No. of Persons Involved in Buying	Average No. of Persons Involved in Buying
Vegetables	117.00	1.17	2500	25
Foodgrains	35.00	1.18	810	27
Mustard Oil	5.00	1.00	115	23
Gur	20.00	1.00	340	17
Fruits	8.00	1.00	160	20
Betel Shops	2.00	1.00	30	15
Baskets & Soop	15.00	1.36	77	7
Shoe Maker (Cobler)	3.00	1.00	45	15
Footwear shops	3.00	1.50	18	9
Meat, Flsh, Egg	22.00	1.10	300	15
Bangles	15.00	1.50	140	14
Small Agriculture Implements	5.00	1.00	50	10
Small Eatables	16.00	1.33	216	18
Cloths	18.00	1.20	120	8
Clay pots	6.00	1.50	28	7
Barber	10.00	1.43	105	15
Total	300	1.18	5054	20

Source : Based on field data

VII. MARKET FEES, REVENUE OBTAINED AND ITS POTENTIAL

In course of detailed interview of the farmers/traders of Gauspur market, it is recorded that they pay Re.1 to Rs.150 per shop per market day to Gauspur Gram Panchayat. In this way, a total average sum of Rs.256 is collected per market day from Gauspur rural market. On this basis of existing market fee collection from each shop of the market, a sum of Rs.26676 is being collected per annum. In this way total existing market fee from the Gauspur rural market is being collected by Gram Panchayat only (Table-7).

Table-7 : Present Rate of Market Fee, Revenue Obtained from Market Fees and Present Potential Revenue per Annum of Gauspur Market

Commodities	Rate of Market Fee at Present	Revenue Obtained from Market Fee per Market Day at Present	Revenue Obtained from Market Fee per annum at present
Vegetables	1.00	100.00	10400
Foodgrains	1.00	30.00	3120
Mustard Oil	1.00	5.00	520
Gur	1.00	20.00	2080
Fruits	1.00	8.00	832
Betel Shops	1.00	2.00	208
Baskets & Soop	1.00	11.00	1144
Shoe Maker (Cobler)	0.50	1.50	156
Footwear shops	1.00	2.00	208
Meat, Fish, Egg	1.00	20.00	2080
Bangles	1.00	10.00	1040
Small Agriculture Implements	1.00	5.00	520
Small Eatables	1.50	18.00	1872
Cloths	1.00	15.00	1560
Clay pots	0.50	2.00	208
Barber	1.00	7.00	728
Total	1.00	256.50	26676

Source : Based on field data

VIII. MODE OF TRANSPORT USED

For bringing the agricultural produce for the sale in Gauspur rural market the farmers/traders are found to be using cycle and rickshaw as a mode of transport. Apart from these, about 12 per cent traders/farmers have reported to be coming on foot and using two different types of containers. For vegetables they use baskets and Mustard Oil is generally contained in milk canes by the farmers for bringing in the market for sale. Since each farmer/trader brings small quantity, therefore, cycle has reported to be used by as high as 71 per cent of all farmers/traders bringing agricultural produce in the market. In case of vegetables, about 69 per cent farmers/traders used cycle, 20 per cent used rickshaw/trolley and remaining 11 per cent have reached the market on foot with their vegetable using baskets. For bringing foodgrains in the market about 73 per cent farmers/traders are found to be using cycle and rest of the 27 per cent rickshaw or trolley. All the farmers/traders bringing Gur and fruits for the sale in the market have used only cycle to transport their produce. The Mustard Oil is also transported to the rural market by farmers/traders in milk containers without using any transport as evident from Table-8.

Table-8: Traders Using Different Mode of Transport to Bring Agricultural Commodities
(No.)

Commo-dities	Cycle	Rickshaw/ Trolleys	Basket	Milk Cane	Total
Vegetables	24(68.57)	7(20.00)	04 (11.43)	--	35 (100.00)
Foodgrains	08(72.73)	3(27.27)	--	--	11 (100.00)
Gur	08(100.0)	--	--	--	08 (100.00)
Fruits	02(100.00)	--	--	--	02 (100.00)
Mustard Oil	--	--	--	03(100.0)	03(100.00)
Total	42 (71.19)	10(16.95)	04(6.78)	03(5.08)	59(100.00)

Note : Figures given in brackets are percentage
Source : Based on field data.

IX. DISTANCE COVERED TO REACH THE MARKET

The rural market of Gauspur is an important bi-weekly market of Khutahan area. Its hinterland extends to around 17 villages. But these villages are not scattered too far from Gauspur market. Large number of farmers/traders (44.07 per cent) come to this market by travelling a distance of only 2 kms. Around 29 per cent of total farmers/traders travel a distance of 2-3 kms. Some 14 per cent of the total farmers/ traders cover an average distance of 3-4 kms. to reach this market. In case of perishable commodities like vegetables and fruits, about 50 per cent farmers/traders cover a distance of 1-2 kms. to reach the market. On an average, farmers/traders travel 2.24 kms. to reach this market to sell their produce. All these characteristics point to the fact that the Gauspur is an important marketing area trading in a sizeable are located at a comfortable distance. Hence, its improvement is going to benefit large number of villages. In Table-9, classification of sample farmers/traders has been made according to the commodities sold by them and distance covered.

Table-9 : Classification of Sample Farmers/Traders According to the Distance Covered to reach the Gauspur Market

(No.)

Commodities	No. of Traders/Farmers Distance Covered Area					Average Distance Covered (Km.)
	0-1 (km.)	1-2 (km.)	2-3 (km.)	3-4 (km.)	Total	
Vegetables	04 (11.43)	17 (48.57)	11 (31.43)	03 (8.57)	35 (100.00)	2.19
Foodgrains	02 (18.18)	05 (45.45)	02 (18.18)	02 (18.18)	11 (100.00)	2.18
Gur	01 (12.50)	02 (25.00)	03 (37.50)	02 (25.00)	08 (100.00)	2.62
Fruits	-	1 (50.00)	--	1 (50.00)	2 (100.00)	2.75
Mustard Oil	01 (33.33)	01 (33.33)	01 (33.33)	--	03 (100.00)	1.67
Total	08 (13.56)	26 (44.07)	17 (28.81)	08 (13.56)	59 (100.00)	2.24

Note : Figures in brackets indicate percentage
Source: Based on field data.

X. NEED OF IMPROVED FACILITIES

It is evident from informations of Gauspur rural market available so far that there is an immense scope and need for making available marketing infrastructural facilities. Therefore, utmost need is to provide improved facilities because all the sample farmers and traders have expressed their desire to have such facilities as shown in Table-10. It becomes obvious that farmers/traders selling different commodities in the market need improved facilities and all of them are willing to pay higher market fee for using the improved marketing infrastructural facilities.

Table-10 : Need of Improved Marketing Facilities in Gauspur Market

Commo-dities	Total No. of Farmers Shop	No. of Farmers Shops requiring improved facilities	No. of farmers willing to pay higher market fee	Total No. of Traders shop	No. of traders shop requiring improved facilities	No. of traders willing to pay higher market fee
Vegetables	28	28 (100.00)	28 (100.00)	7	7 (100.00)	7 (100.00)
Foodgrains	6	6 (100.00)	6 (100.00)	5	5 (100.00)	5 (100.00)
Gur	7	7 (100.00)	7 (100.00)	1	1 (100.00)	1 (100.00)
Fruits	1	1 (100.00)	1 (100.00)	1	1 (100.00)	1 (100.00)
Mustard Oil	3	3 (100.00)	3 (100.00)	--	--	--
Total	45	45	45	14	14	14

Note : Figures in brackets indicate percentage.

Source : Based on field data.

XI. TYPE OF MARKETING FACILITIES REQUIRED

As it is seen that infrastructural facilities are largely lacking in the Gauspur market, the farmers/traders who bring different agricultural produce for sale in this market were asked through PRA method by innumerators of study research team regarding type of infrastructural facilities they require. The farmers/traders who responded to their questions are present in Table-11. It is evident from information presented in table that all farmers/traders are in need of facilities like – drinking water, platform and proper drainage. The electricity, toilet, proper place for selling and cycle stand are some other important facilities required by 88 to 71 per cent of existing farmers/traders dealing in the market of Gauspur. Some 50 to 70 per cent farmers/traders are also found to be in need of storage facilities and permanent shops for the smooth sale in the market of Gauspur. Giving their views on type of infrastructural facilities required, all female farmers/traders coming in this market have shown requirement for proper drainage, toilets, drinking water, road and electricity. The second important group of facilities for them turns out to be proper place for sitting, permanent shops and tin sheds. These facilities are required to at least 85 per cent of female farmers/traders coming in this market. Some other facilities like platform and storage are also demanded by 14 to 30 per cent female farmers/traders.

Table-11 : Type of Marketing Infrastructural Facilities Required by the Farmers/Traders of Gauspur Market

Commodities	Total No. of Farmers/ traders	Place	Dri-king Water	Shed	Plat-form	Electri-city	Stor-age	Toilet	Perma-nent shop	Cycle Stand	Proper drain-age	Road
Vegetables	35	25 (71.43)	35 (100.0)	34 (97.12)	32 (91.42)	27 (72.14)	16 (45.71)	31 (88.57)	15 (42.86)	22 (62.86)	35 (100.0)	35 (100.0)
Male	32	22 (68.75)	32 (100.0)	32 (100.0)	32 (100.0)	24 (75.00)	16 (50.00)	28 (87.50)	13 (40.63)	22 (68.75)	32 (100.0)	32 (100.0)
Female	3	03 (100.0)	3 (100.0)	2 (66.67)	-- (100.0)	3 (100.0)	-- (100.0)	3 (66.67)	2 (66.67)	-- (100.0)	3 (100.0)	3 (100.0)
Foodgrains	11	7 (63.64)	11 (100.0)	11 (100.0)	11 (100.0)	11 (100.0)	6 (54.55)	4 (36.36)	4 (36.36)	8 (72.73)	11 (100.0)	11 (100.0)
Male	11	7 (63.64)	11 (100.0)	11 (100.0)	11 (100.0)	11 (100.0)	6 (54.55)	4 (36.36)	4 (36.36)	8 (72.73)	11 (100.0)	11 (100.0)
Female	-	--	--	--	--	--	--	--	--	--	--	--
Gur	8	5 (62.50)	8 (100.0)	8 (100.0)	8 (100.0)	6 (75.00)	2 (25.00)	5 (62.50)	3 (37.50)	8 (100.0)	7 (87.50)	8 (100.0)
Male	8	5 (62.50)	8 (100.0)	8 (100.0)	8 (100.0)	6 (75.00)	2 (25.00)	5 (62.50)	3 (37.50)	8 (100.0)	7 (87.54)	8 (100.0)
Female	-	--	--	--	--	--	--	--	--	--	--	--
Fruits	2	1 (50.00)	2 (100.0)	2 (100.0)	1 (50.00)	2 (100.0)	1 (50.00)	2 (100.0)	2 (100.0)	1 (50.00)	2 (100.0)	2 (100.0)
Male	1	1 (100.0)										
Female	1	-- (100.0)	1 (100.0)	1 (100.0)	-- (100.0)	1 (100.0)	-- (100.0)	1 (100.0)	1 (100.0)	-- (100.0)	1 (100.0)	-- (100.0)
Mustard Oil	3	3 (100.0)	3 (100.0)	3 (100.0)	2 (66.67)	3 (100.0)	1 (33.33)	3 (100.0)	3 (100.0)	--	3 (100.0)	3 (100.0)
Male	-	--	--	--	--	--	--	--	--	--	(100.0)	(100.0)
Female	3	3 (100.0)	3 (100.0)	3 (100.0)	2 (66.67)	3 (100.0)	1 (33.33)	3 (100.0)	3 (100.0)	--	3 (100.0)	3 (100.0)
Total	59	41 (69.49)	59 (100.0)	58 (98.31)	54 (91.52)	49 (83.05)	26 (44.07)	45 (76.27)	27 (45.76)	39 (66.10)	58 (98.31)	59 (100.00)
Male	52	35 (67.31)	52 (100.0)	52 (100.0)	52 (100.0)	42 (80.77)	25 (48.08)	38 (73.00)	21 (40.38)	39 (75.00)	51 (98.08)	52 (100.0)
Female	7	6 (85.71)	7 (100.0)	6 (85.71)	2 (28.57)	7 (100.0)	1 (14.29)	7 (100.0)	6 (85.71)	--	7 (100.0)	7 (100.0)

Note : Figures in brackets indicate percentage.

Source : Based on field data.

XII. EXPECTED INCREASE IN ARRIVALS AFTER MARKET IMPROVEMENT

It is found in the foregoing analysis that in rural market of Gauspur (i) market infrastructural facilities are mostly absent and (ii) the farmers/traders of the market want improved facilities by paying required market fee. In view of this, it has been tried to

assess that how much increase in turn over of different agricultural commodities would result on account of provision of improved infrastructural facilities. This analysis has been presented in Table-12. It is shown in table-12 that the arrivals of vegetables are expected to grow by 55 per cent, foodgrains 53 per cent, gur 110 per cent, Mustard Oil 115 per cent and fruits 21 per cent. In total, the arrivals of all agricultural commodities are expected to experience a growth of around 58 per cent per market day if improved market infrastructural facilities are made available in this market. The increase in arrivals of all agricultural produce will result on account of increase in present arrivals and increase in number of new shops of around twenty(20).

Table-12: Expected Increase in Arrivals of Agricultural Produce After Market Improvement in the Gauspur Market

Commodities	Vegetables	Food-grains	Gur	Fruits	Mustard Oil	All Agricultural Produce
Number of Sample Shops	35	11	8	2	3	59
Sample Total Qty. expected to be sold by sample shops per market day	2956	1425	355	145	100	4990
Average Qty. expected to be sold by sample shops per market day (kg.)	84.71	129.55	44.375	72.50	33.33	84.58
Total No. of Shops in the market	100	30	20	8	5.00	163
Total Qty. Expected to be sold per market day in existing shops (kg.)	8472	3886.5	887.50	580	166.65	13786.54
Expected increase in number of new Shops	10	3	3	2	2	20
Expected turnover of new entrants	847.10	388.65	133.125	145	66.66	1691.6
Total expected increase in turnover per day (kg.)	9318.10	4275.15	1020.625	725	233.21	15478.14
Actual Qty. sold per market day (kg.)	6017	2800.91	487.40	600.00	108.35	9788.29
Percentage Increase	54.86	52.63	109.40	20.83	115.24	58.13

Source : Based on field data.

XIII. ECONOMIC BENEFITS EMANATING FROM IMPROVEMENTS IN THE INFRASTRUCTURE OF RURAL HAAT/PAINTHS

There are many objectives for making improvement in the existing rural haat/painths in Uttar Pradesh. We have already discussed those at proper place. But apart from those there are other economic benefits which are likely to accrue in the process of market improvements. These benefits become important factor in justifying the initiative of market improvement programme in a rural market. The economic benefits may broadly grouped under following categories:

1. As a result of increased volume of trade due to market improvement, the percentage increase in per unit cost of sale turns out to be far lower as compared to percentage increase in market fee collection.
2. Improved efficiency of market operations in the form of better product display, better facilities and availability of more marketing hours for the buyers and sellers resulting in high per unit price of agricultural produce. Hence, providing remunerative prices to the farmers/traders.
3. Reduction in spoilage of perishable crops; vegetables and fruits with the availability of improved rural marketing infrastructure.
- I. Since it is very logical to propose before farmer/trader having shops in the market for bearing higher market fee because of availing better market infrastructrure, the shops owners in the rural market of Gauspur have convincingly agreed to pay higher market fee for availing improved market infrastructural facilities. Besides, some (30) new shops are expected to generate additional market fee by joining the Gauspur market for avalling Improved Infrastructural facilities In Gauspur market.

Table-13 presents the detailed picture of required increase in market fee collection for different marketed produce owing to expected market improvements. As per Table, per market average fee collection from all existing shops comes to Rs.256.50, which will go upto Rs.1280.00 after market improvements. It is our estimate that around 31 new shops will be added to the existing 254 shops and this will generate required amount of Rs.1280 as market fee per market day to meet the cost of capital for creating additional infrastructural facilities in Gauspur market. If we consider it on annual basis, the expected increase in total revenue, i.e. Rs.1280.00 can be multiplied by 104 days of a year on which market will be held. It comes to around Rs.133000.00 i.e. required revenue generation.

Table-13 : Actual Market Fee Paid and Increased Market Fee Required to be paid by Traders/Farmers for Improved Market of Gauspur

Commodity	No. of Total Shops at present	Market Fee Collected Presently from Total No. of Shops (Per Market Day)	Expected Total No. of Shops after Market Improvement (No.)	Total Increased Market Fee Required for Market Improvement (Per Market Day)
Vegetables	100	100.00	110	494.00
Foodgrains	30	30.00	33	148.00
Mustard Oil	5	5.00	7	32.00
Gur	20	20.00	23	103.00
Fruit	8	8.00	10	45.00
Betal Shops	2	2.00	2	9.00
Basket shops	11	11.00	12	54.00
Cobbler	3	1.50	3	14.00
Footwear Shop	2	2.00	2	9.00
Meat and Fish	20	20.00	24	107.00
Bangles	10	10.00	11	50.00
Small Agricultural Implements	5	5.00	6	27.00
Small eatables	12	18.00	13	58.00
Clothes	15	15.00	17	76.00
Clay Pots	4	2.00	4	18.00
Barber	7	7.00	8	36.00
Total	254	256.50	285	1280.00

Source : Based on field data

Despite increased market fee collection, in real terms, per unit cost of improved marketing facilities in case of all produces sold in the market remains marginally high. Table-14 shows that increased market fee would result in an overall 349.15 per cent increase in market fee collection. As compared to this estimate has shown increase per unit cost of marketing would remain only 150 per cent after market improvements. Increase per unit cost of marketing is likely to vary from 150 per cent in case of vegetable and gur to 200 per cent in case of fruit products. Whatever marginal increase in per unit cost of marketing is visible in our estimates, it is not expected to remain same in coming years due to fast improvement in volume of trade in existing shops and entry of new farmers/traders in the market. Thus, provision of improved market facilities without significant increase in marketing cost from the very beginning in the Gauspur market may be considered to be a significant economic benefit.

Table-14 : Change in Marketing Cost Before and After Market Improvement

Commodities	Present Market Turn Over of Sample Shops (Per Market Day) (Kg.)	Total Market Fee Collected Presently from Sample Shops (Per Market Day) (Rs.)	Expected Market Turn-over after market improvement in sample shops (Kg.)	Total Required Collection as Market Fee from Sample Shops (Rs.)	Percentage Increase in Fee Collection after Market Improvement (Rs.)	% Increase in Per Unit Marketing Cost (Rs.)
Vegetables	2106	35.00(0.02)	2956.00	157.20(0.05)	349.14	150.00
Foodgrains	1027	11.00(0.01)	1425.00	49.40(0.03)	349.09	200.00
Gur	195	8.00(0.04)	355.00	36.00(0.10)	350.00	150.00
Fruits	150	2.00(0.04)	145.00	9.00(0.06)	350.00	200.00
Mustard Oil	65	3.00(0.05)	100.00	13.40(0.13)	346.66	160.00
All Agricultural Produce	3543	59.00(0.02)	4990.00	265.00(0.05)	349.15	150.00

Note : Figures in brackets show per unit marketing cost.

Source : Based on field data.

II. With the availability of improved marketing facilities and infrastructure in the bi-weekly market of Gauspur farmers/traders are expected to maintain the quality of their products to be sold in the market. In other words, they will be able to bring their produce in the market in a more presentable manner. Buyers will also feel more comfortable and confident while purchasing the agricultural produce under improved marketing conditions. Under such improved market conditions sellers of produce may very easily justify at least 5 per cent increase in the prices of their produce. As there would be either very low or no real increase in per unit cost of marketing of agricultural produce. The hike in prices would be a net gain to the farmers/traders selling their produce in the market of Gauspur.

Table-15 exemplifies the net gain coming out of 5 per cent hike in average prices of agricultural and other produces on account of improved market efficiency in the rural market of Gauspur. These estimates are based on quantity and prices of vegetable, foodgrains, gur, fruits and Mustard Oil recorded from sample shop owners in Gauspur rural market of Khutahan block in district Jaunpur. However, the estimates are approximate because the factor of seasonality has not been taken into consideration. It is evident from figures that under this process the highest gainers are of farmers/traders in foodgrains followed by others dealing in vegetables, gur, Mustard Oil and fruits marketing respectively in Gauspur market. Figures presented in Table-15 show that the farmers/traders involved in the trading may gain a sum of Rs.423248.80 per annum with the introduction of market improvements in Gauspur market.

Table-15 : Estimation of Net Gain in Marketing Under Market Improvement

Commodities	Estimated Total Value of Commodities sold per market at present (Rs.)	Estimated value of commodities to be sold per market day after market improvements (at current prices) (Rs.)	Estimated Value of Commodities to be sold after market improvements 5% high prices (Rs.)	Net gain per market day (Rs.)	Net gain per annum (Approx.) (Rs.)
Vegetables	15042.50	23295.24	24460.00	1164.76	121135.04
Foodgrains	21006.83	32063.63	33666.80	1603.17	166729.68
Gur	4386.60	9185.63	9645.00	459.57	47795.28
Fruits	6600.00	7975.00	8373.70	398.70	41464.80
Mustard Oil	4117.30	8862.00	9305.50	443.50	46124.00
Total	51153.23	81381.50	85451.00	4069.50	423248.80

Source : Based on field data.

Other indirect economic benefits are also involved in the process of efficient marketing system. A transparent and efficient system, as suggested for Gauspur market, will reduce the interference of middlemen and brokers in the determination of agriculture and other produce prices in the market. This will result in direct benefit to farmers/traders on account of increased prices. This gain may lead to expansion of agricultural activities resulting in higher production in the catchment area of Gauspur market.

III. Erection of marketing infrastructural facilities in Gauspur market may provide special benefit in the trading of perishable produce like vegetables, fruits and Gur. In

case of vegetables, fruits and Gur, availability of facilities like water shed, light and storage may reduce at least 20 per cent spoilage of arrivals in the Gauspur market.

Data relating to proportion of vegetables in total market turn over come around 58 per cent in Gauspur market. It is expected to go higher with the availability of above listed infrastructural facilities. In case of fruits the spoilage rate is found to be over 40 per cent during the peak season in Gauspur market.

With the availability of water shed and storage the spoilage rate under such conditions may go down to less than 20 per cent. In case of meat and fish marketing, the availability of better infrastructural facilities will reduce the spoilage of these produce to a considerable extent. Apart from this the hygienic conditions will also be maintained with the availability of these facilities in the market. Under the ordinary conditions the spoilage of fruits and meat products is 25 to 35 per cent and it could be reduced to 15 to 10 per cent with the availability of required infrastructural facilities in Gauspur market of Khutahan block.

XVI. FINANCIAL AND ECONOMIC APPRAISAL OF INVESTMENT IN RURAL MARKET OF GAUSPUR

Introduction

Rural markets are a hub-centre of socio-economic activities in a region. Along with public services such as Primary Health Centre, Veterinary Hospital, Post Office, Bank, Educational Institutions, Play Ground, PCO, Police Station, etc., they provide a

fillip to the tempo of social, cultural and economic growth of the region comprising of a number of villages from where buyers and sellers of goods and services are attracted to these markets.

Existing conditions in some such markets are far from satisfactory. A typical market may consist of some stalls of a temporary nature and sellers sit on ground and on chabutras of houses and shops, open to sky without any shed or cover. Quite often they are held once, twice or thrice a week during the afternoon hours. Some may be the daily markets also.

The products traded in such markets include vegetables, fruits, edible oil, spices, jaggery, foodgrains, meat, fish, ready made wears, chappals, sweets, chhats, general goods and services of cobblers, smiths, barbers, etc. Arrival of commodities in the market fluctuates, depending upon the season and other factors.

Catchment area of such rural markets comprises of a large number of smaller and big villages in the vicinity of the village in which the market is held. Total catchment area of such markets may cover a distance of some 6-8 kms. comprising of 10-15 villages or even more.

The following are some of the important infrastructure and public utilities usually required in such markets:

- (1) Pucca open platforms
- (2) Shaded platforms
- (3) Pucca Shops
- (4) Space for Market Information Centre and Office for Market Management Committee

- (5) Room for Security Guard
- (6) Place for parking of cycles, scooters, buggies, horse-carts, tractor-trolleys, etc.
- (7) Storage facility
- (8) Electrification
- (9) Drainage facility
- (10) Boundary wall and Fencing around the haat area with the gates
- (11) Construction of Roads
- (12) Cattle Shed with drinking water facilities
- (13) Drinking wader
- (14) Toilets
- (15) Place for waste disposal
- (16) Plantation of trees

Management of the Market

Quite often the rural market is managed by the Gram Panchayat which realizes 'Tehbazari' from the traders. Another alternative arrangement is that the contract is awarded to a contractor for a stipulated amount per period and the contractor collects Tehbazari from the shopkeepers at predetermined rates. Gram Panchayat may form a "Market Management Committee" (MMC) to monitor the various activities of the market. The committee may take decisions on the mode of maintenance, management, rate of Tehbazari, method of its realization and settlement of disputes related to the market.

Construction of a market with covered and open pucca platforms, fencing around the area and facilities for storage, toilets, water supply, proper drainage and parking, etc.

can bring about an improvement in the conditions in such rural markets. Shopkeepers are willing to pay the 'Tehbazari' at higher rates provided proper facilities are developed.

Financial Analysis of Investment in Infrastructure

Initial investment is required on land and on capital cost involved in the creation of infrastructural facilities described above. Land for rural market could be the land owned by the Gram Panchayat, so that no investment is required to be made on this count.

Upkeep of the infrastructure is a must for the sustainability and trouble-free services. Below we provide estimates of expenditure (both capital and revenue type) required to be made in Gauspur market located in Khutahan Block of Jaunpur District, for which this feasibility study is being carried out (For details of the mathematical approach involved in this, see the Appendix given at the end).

XVII. FINANCIAL ANALYSIS OF PROPOSED INVESTMENT IN GAUSPUR MARKET

Here we evaluate financial viability for providing facilities for the improvement of infrastructural facilities and other amenities in the rural market of Gauspur. Parameters involved in the financial analysis are detailed below:

1. Initial Capital Investment

Since the Gauspur market, at present, lacks infrastructural facilities therefore substantial amount will have to be spent on the modernisation of the market.

Platform/sheds need to be constructed, water supply is to be arranged and other infrastructural facilities are to be provided. All this would require capital expenditure. According to our estimate, Rs.9,25,000/- would be needed as initial capital, which will have to be spent over a time span of one year. This may be termed as initial capital investment. We also assume that the entire capital investment will be made instantaneously at the beginning of the year. This is not an unrealistic assumption.

2. Life Span of the Project

The market infrastructural facilities proposed to be provided in the Gauspur market would have usefulness for a fairly long period of time though depreciation is bound to take place with the passage of time. The actual life span of the project cannot be estimated with high degree of accuracy but on the basis of technical opinion of the Architect/Civil Engineer, it is assumed that the facilities proposed to be provided would last for a period of at least 15 years. It may not be unrealistic to assume that the facilities provided would remain useful even for a period of 20 years and above. In case of Gauspur market we have taken the life span of the project to be 15 years. Thus, scrap value of the initial infrastructural facilities created at a cost of Rs.9,25,000/- has been treated as 30% of the initial capital cost.

3. Cost of the Capital

Cost of the capital for project is a critical factor which determines the viability of project. Cost of capital based on the competitive interest rates prevailing in the market

would be too high if considered for this market. For socially desirable activities, it is even worthwhile to examine the financial viability at a relatively lower cost of capital. In practice also, the agencies involved in financing socially desirable activities encourage development of infrastructural facilities at a lower rate of capital cost. The projects so financed have plethora of social benefits, apart from financial benefits emanating from the project financed.

Keeping all this in view, 12 per cent annual cost of capital has been considered in the financial analysis of the Gauspur Market.

4. Cost of Repair and Maintenance

The proposed facilities to be provided in the market are bound to depreciate over the passage of time. Proper maintenance and upkeep of facilities in good condition is a social as well as economic necessity.

Keeping this objective in view, adequate provision has been made to account for the cost likely to arise on account of repair and maintenance. Items of expenditure under this head are as follows:

- (a) Expenditure on labour, materials and overheads for repair and maintenance of facilities;
- (b) Repair/Replacement of water pumps, electrical equipments and accessories etc. from time to time;
- (c) Salaries and wages payable to persons employed for the upkeep of facilities created by the project.

Details of annual maintenance expenditure are as follows:

1.	Watchman for Security @ Rs.1500 per month	Rs.18,000
2.	Sweeper for cleaning for 104 days @ Rs.40 per day	Rs. 4,160
3.	Electrical Maintenance for 104 days @ Rs.100 per day	Rs.10,400
4.	Maintenance of Handpump	Rs. 1,000
<hr/>		
	Total	Rs.33,560
<hr/>		
The above expenditure is expected to increase @ 5% annually.		

Technical estimates suggest that there would be zero expenditure on repair and maintenance of the project during the first year. It is assumed that during second and third years, 2 per cent of the initial investment would be required for repair and maintenance. During the years 4 to 7, this will be 3% of the initial investment and thereafter @ 5 per cent of the initial capital investment will be needed for repair and maintenance of civil work and other infrastructural facilities till 15th year.

5. Revenues Arising from the Market

The completion of the market improvement programme would result into substantial improvement in the working conditions of the Gauspur market. Farmers and traders would get a sizeable and respectable place to sit in and transact the business. They would be saved from the inconvenience arising due to limited space, open sale and bad weather. There is always a good-will value associated with a good looking shop.

As a result of improved facilities in the market it is expected that on account of availability of improved facilities the users of market would be willing to pay an increased market fee and rent for using these facilities.

Views of farmers/traders were solicited on the required increase in the market fee recoverable from them after market improvement programme is carried out. Incremental increase in revenue due to creation of infrastructural facilities has been put at Rs.1,33,000 in the initial year. This is expected to go up @ 10% per annum.

NPV (Net Present Value) of Investments in the Projects

Based on the assumptions stated above, the sources of cash inflows and outflows are as follows:

Inflows

- (a) Expected increase in revenue (Beginning at Rs.1 lakh per annum and going up @ 10% per annum)
- (b) Terminal value of initial investment (after 15 years from now) (30% of initial capital cost)

Outflows

- (c) Initial capital cost (Rs.9,25,000)
- (d) Cost of Repair and Maintenance (Rs.33560 in the initial year and expected to increase @ 5% per annum)
- (e) Cost of maintenance of civil work and other infrastructural facilities (2% of capital cost in years 2 and 3, 3% in years 4 to 7, and 5% from years 8 onwards).

**Table 16: Computation of NPV and IRR on the basis of Expected Cash Flows
(Financial Point of View)**

Year	Addl Revenue Generated (based on increase @ 10% p.a.)	Terminal Value	Initial Capital Cost	Cost of Repair & Maintenance (based on increase @ 5% p.a.)	Rate of Increase in the Maintenance cost of civil work	Cost of Maintenance of Civil Work (based @ 2% of initial investment in years 2&3 and 5% thereafter)	Net Cash Flow
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
0		925000					(925000)
1							0
2	133000			33560	0.02	18500	80940
3	146300			35238	0.02	18500	92562
4	160930			37000	0.03	27750	96180
5	177023			38850	0.03	27750	110423
6	194725			40792	0.03	27750	126183
7	214198			42832	0.03	27750	143616
8	235618			44974	0.05	46250	144394
9	259179			47222	0.05	46250	165707
10	285097			49583	0.05	46250	189264
11	313607			52063	0.05	46250	215294
12	344968			54666	0.05	46250	244052
13	379465			57399	0.05	46250	275816
14	417411			60269	0.05	46250	310892
15	459152	277500		63282	0.05	46250	627120

NPV = Rs.3025; IRR = 12% per annum

Based on a cost of capita of 12%, the NPV of the project is Rs.3025 thousand.

However, with changes in the cost of capital the NPV of the project is as follows:

Table 17: Impact of Changes in Cost of Capital on Net Present Value

Cost of Capital	NPV (in Rs.)
0.06	625475
0.08	369817
0.10	166334
0.12	3025
0.14	(129112)
0.15	(185686)
0.16	(236881)

Additional revenue arising due to the proposed investment on infrastructural facilities is expected to be Rs.1,33,000 per annum in the initial year. However, if this falls short of the expectations, NPV becomes negative. In the tables below, the NPV and IRR are given for different amounts of additional revenue generated in the initial year ranging from Rs.130000 to as high as Rs.173000 along with the rates of growth in the revenues ranging from 5% per annum to 20% per annum.

Table 18 : Table Giving NPV at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)						
	130000	133000	143000	153000	163000	173000	
0.05	(334393)	(311630)	(235755)	(159879)	(84003)	(8127)	
0.06	(281216)	(257226)	(177260)	(97293)	(17327)	62639	
0.08	(162990)	(136272)	(47211)	41850	130910	219971	
0.10	(26835)	3025	102560	202094	301628	401162	
0.12	130113	163596	275203	386810	498417	610024	
0.14	311162	348822	474356	599890	725424	850958	
0.15	411695	451879	585162	718445	851727	985010	
0.20	1040043	1094524	1276125	1457727	1639329	1820931	

Table 19 : Table Giving IRR at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)						
	13000	133000	143000	153000	163000	173000	
0.05	0.062	0.067	0.081	0.094	0.107	0.119	
0.06	0.074	0.078	0.092	0.105	0.117	0.129	
0.08	0.095	0.100	0.113	0.126	0.138	0.150	
0.10	0.116	0.120	0.134	0.146	0.158	0.170	
0.12	0.136	0.140	0.154	0.166	0.178	0.189	
0.14	0.156	0.160	0.173	0.185	0.197	0.208	
0.15	0.165	0.169	0.182	0.195	0.206	0.217	
0.20	0.212	0.216	0.228	0.240	0.252	0.263	

Accumulations in the Sinking Fund

Surpluses of revenues over expenditure can be used for further expansion of facilities in the market and for providing additional facilities to sellers and buyers. These funds can be invested in safe and profitable investment avenues with a view to get a lump sum amount of money which can be used for replacement of infrastructural facilities when they get decayed and outdated. The deposits in the fund are expected to be as follows, depending upon the rate of interest earned on investments:

Table 20: Table giving accumulated value of Deposits made in the Sinking Fund at Different Rates of Interest, as at the end of 15 years

Rate of Interest	Revenue of the Initial Year (Rs. in Lakh)					
	130000	133000	143000	153000	163000	173000
0.08	39.78	41.07	45.38	49.68	53.98	58.28
0.09	41.88	43.25	47.81	52.37	56.92	61.48
0.10	44.14	45.59	50.42	55.25	60.09	64.92
0.11	46.56	48.10	53.23	58.36	63.49	68.62
0.12	49.16	50.80	56.24	61.69	67.14	72.59
0.13	51.96	53.69	59.49	65.28	71.07	76.86
0.14	54.96	56.81	62.97	69.13	75.29	81.45
0.15	58.19	60.16	66.71	73.27	79.83	86.38

ECONOMIC ANALYSIS

The following intangible benefits of the investment are particularly noteworthy:

- (1) Increase in the value of transactions carried out in the market
- (2) Benefits for women
- (3) Technology dissemination and technology development
- (4) Reduction in spoilage
- (5) Dissemination of market intelligence
- (6) Encouragement in the trade of agricultural and horticultural produce

As is quite obvious, if we take into consideration the impact of the above mentioned intangible factors on the NPV or IRR of the project, then investment on

infrastructure in a rural market becomes a highly profitable proposition. Detailed calculations incorporating various aspects of social cost benefit analysis have not been carried out.

We have considered in this study the financial dimensions of the project and have gathered information relating to financial viability. Ultimate success of the project would depend on how imaginatively the project is managed in all its aspects. In this regard, sound financial management is of great importance.

There are considerable moral and cultural benefits accruing from the investment. Such investment cannot be looked as an instrument merely for solving the problems of poverty and backwardness. The real contribution of the investment is in terms of enhancing the quality of life of the people in the region. The project would be advantageous from different view points.

Some such non-tangible benefits accruing from investment in the project are detailed below:

- (1) Markets are held under unhygienic conditions as at present. Food articles, vegetables are kept under exposed conditions and become carriers of diseases and ailments. The project would create healthy and hygienic conditions and thereby the physical well being of the people would be improved.
- (2) Market is a place of social interaction. It is a venue where people belonging to the region converge for a day or two in a week and buy articles of daily

consumption. Improved condition in the market enables people to buy good quality products and thus the quality of life would be improved.

- (3) Political and social reform activities are conducted through these markets. Improved conditions in the market would attract more and more people to come to the market and derive benefits.
- (4) Improved conditions in the market could lead to increased business activities and increased arrival of articles of consumption. More business transactions would be carried out through the market and consequently more employment as well as income generation opportunities would be opened up.
- (5) Consciousness about new products and technology, etc. would be spread through the market. This would lead to improvement in the living standards of people. Companies can launch new products and processes suited for local consumption through these markets.
- (6) Climatic conditions reach extreme level during summer, winter and rainy seasons. Conditions become extremely bad particularly during the rainy season and the arrivals of articles is adversely affected. During summer also, when temperature level reaches high, it becomes very difficult both for the traders as well as the customers to visit the market. During winter season also, chilly winds prevent customers and traders to visit the market. Improved conditions would increase the number of days during which the markets are held.

- (7) When markets are not held regularly or when customers do not arrive in adequate numbers, agricultural produce particularly the perishable vegetables get spoiled or they have to be sold at low price resulting into loss for the producers as well as consumers. Poor and vulnerable sections of the society are particularly harmed on account of poor conditions in the market.
- (8) Improvement in the market would lead to increased economic activity in the region. It would lead to more efficient and effective utilization of the natural as well as man-power resources available in the region.
- (9) Cultural activities would be encouraged through improved working conditions. Social welfare and reform activities can also be carried out more easily by improving the conditions in the market.

In a nutshell, the conditions in the market indicate the level of development of civilization. The investment under consideration is a contribution towards civilizational development and thus carries within it several non-financial and non-economic benefits.

If these are taken into consideration, the true value of NPV and IRR is much higher than has been computed in the study. This is shown in the table below. Here we have added an amount equal to 10% of the incremental trading caused due to generation of infrastructural facilities in the market. Savings caused due to reduction in spoilage @ 2% of the additional trading have also been added.

Table 21 : Computation of NPV and IRR on the basis of Economic Analysis

Cash Flow on the basis of Financial Analysis	Benefits of Increase in Trading	Benefit due to Reduction in Spoilage	Total Cash Flow
80940	42325	8465	131730
92562	44441	8888	145892
96180	46663	9333	152176
110423	48996	9799	169219
126183	51446	10289	187918
143616	54019	10804	208438
144394	56720	11344	212457
165707	59556	11911	237174
189264	62533	12507	264304
215294	65660	13132	294086
244051	68943	13789	326784
275816	72390	14478	362684
310692	76010	15202	402104
627120	79810	15962	722892
NPV = 388399; IRR = 16.982%			

WORDS OF CAUTION

Financial viability of the project depends primarily on :

- (1) Surplus of Revenue over expenses (Net Cash Flow); and
- (2) The cost of capital.

In the Table 22 given below, we have calculated the requirements of net cash flow based on different life spans of the project ranging between 15 to 40 years and on the basis of cost of capital ranging between 5% to 18% per annum for an initial investment of Rs.925000 on the infrastructural facilities in the market. The results are quite revealing

in the same that if the market fails to generate a minimum revenue as given in the table, the investment would not be financially viable proposition.

Table 22 : Table Giving Equivalent Annual Cost for Different Life Span of the Project at Different Costs of Capital

Cost of Capital (k)	Life of Project (n) (in Years)						
	15	20	25	30	35	40	
0.05	89117	74224	65631	60173	56491	53907	
0.06	95241	80646	72360	67200	63801	61477	
0.08	108067	94213	86653	82165	79368	77571	
0.10	121613	108650	101905	98123	95913	94590	
0.12	135812	123838	117937	114833	113143	112206	
0.15	158191	147779	143097	140878	139800	139270	
0.16	165906	156017	151712	149744	148825	148392	
0.18	181673	172808	169200	167669	167009	166722	

APPENDIXMATHEMATICAL APPROACH INVOLVED IN THE APPRAISAL OF
INVESTMENT ON INFRASTRUCTURE IN A RURAL MARKET

Let the initial investment on the development of infrastructural and public utilities in a market be Rs. 1. It takes about one year to complete the construction of the facilities and these are available for use after a period of one year since construction commences. It is assumed that incremental expenditure on maintenance of the facilities is incurred all at the end of every year and commences from the end of 2 years since construction starts. This same logic holds for incremental revenues also. The gap between Incremental revenues and incremental expenditures (i.e. surplus of revenues over expenditures) is assumed to be Rs.X in the beginning (i.e. at the end of 2 years since construction etc. starts) and this increases in real term, @ g per annum. Useful life span of the initial investment is taken to be 14 years with an assumed depreciation @ 5% per annum simple, so that the terminal value of the infrastructural facilities created in the first year would remain to be 30% of the initial investment 1. Cost of capital is assumed to be 'k' per annum.

Based on the above logic,

$$I = \frac{X}{(1+k)(g-k)} \cdot \frac{\frac{1+g}{1+k}^{14} - 1}{(1+k)^{15} - 0.30} X, \text{ and}$$

$$X = \frac{[(1+k)^{15} - 0.30] (1+k)(g-k)}{[(1+k)^{15} \left[\frac{(1+g)^{14}}{(1+k)^{14}} - 1 \right]]} I$$

If k and g are assumed to be 12% and 10% respectively, the above expression becomes

$$I = 10.53 \cdot X \cdot (Bx), \text{ or equivalently}$$

$$X = 0.095 \cdot I \quad (C.I.)$$

If cost of capital (k) ranges between 6% to 15% and the growth in surplus (g) ranges between 5% to 20%, the following matrix giving the values of the coefficients involved in the above expression $X = .095 \cdot I$ is generated.

Table 23: Table giving the values of 'C' in the expression $X = C \cdot I$. at different rates of cost of capital and rates of growth

		k = Cost of capital					
		0.0600	0.0800	0.1000	0.1200	0.1400	0.1500
g = rate of growth in surplus of revenues over expenditures	0.0500	0.0746	0.0900	0.1067	0.1246	0.1437	0.1538
	0.0600	NA	0.0849	0.1009	0.1182	0.1367	0.1465
	0.0800	0.0620	NA	0.0901	0.1061	0.1234	0.1326
	0.1000	0.0546	0.0668	NA	0.0950	0.1110	0.1195
	0.1200	0.0479	0.0589	0.0712	NA	0.0995	0.1074
	0.1400	0.0419	0.0518	0.0629	0.0753	NA	0.0962
	0.1500	0.0392	0.0486	0.0591	0.0709	0.0840	NA
	0.2000	0.0277	0.0348	0.0429	0.0520	0.0624	0.0680

(X = Surplus of revenue over expenditure required to be generated at the end of year 2, I = Initial capital outlay, C = Coefficient values computed on the basis of the assumptions stated in the model)

The above table acts as a ready reckoner to ascertain the amount of surplus of revenues over expenditures required to be generated on annual basis with a constant annual growth rate of 'g' and a given cost of capital 'k' in order to justify (on the grounds of financial viability) the initial investment of Rs.1 in a market. As an example, if initial capital outlay on a market is Rs.10 lakhs, then $.095 \times \text{Rs.}1000000 = \text{Rs.}95000$ is the annual surplus of revenues over expenditures which is required to be generated at the end of the initial year (i.e. year 2) in which facilities are made available for use. This should grow annually @ 10% per annum ($g=.10$) in order to make the project viable from financial point of view.

Reciprocals of the values given in the table 21 above, gives the values of B in the expression $I = BX$. Results are as follows:

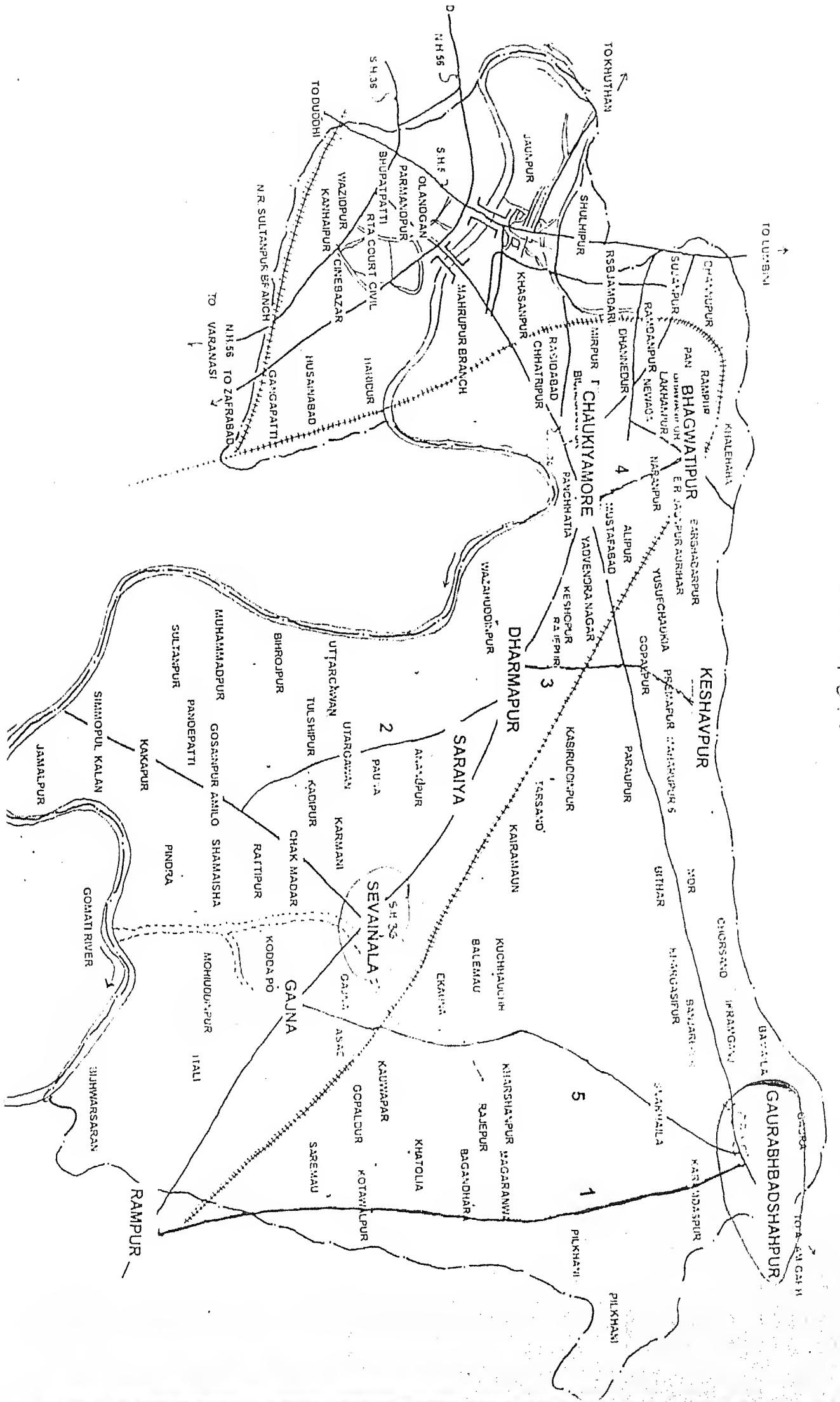
Table 24: Table giving the values of 'B' in the expression $I = BX$ at different rates of cost of capital and rates of growth

g = rate of growth in surplus of revenues over expenditure	k = Cost of capital						
	0.06	0.08	0.10	0.12	0.14	0.15	
0.05	13.40	11.11	9.38	8.03	6.96	6.50	
0.06	NA	11.77	9.91	8.46	7.31	6.83	
0.08	16.13	NA	11.09	9.42	8.10	7.54	
0.10	18.32	14.98	NA	10.53	9.01	8.37	
0.12	20.88	16.97	14.05	NA	10.05	9.31	
0.14	23.85	19.29	15.89	13.28	NA	10.39	
0.15	25.52	20.58	16.91	14.10	11.91	NA	
0.20	36.04	28.73	23.32	19.21	16.03	14.71	

The above table acts as a ready reckoner to ascertain the maximum amount of capital investment, which should be made on the expectation of a given amount of

surpluses of revenues over expenditures. As an example, if it is expected that a surplus of Rs.95000 can be generated in the initial year, then the investment will remain financially viable upto a maximum investment of $Rs.10.53 \times 95000 = Rs.10$ lakhs. An initial investment of an amount less than Rs.10 lakhs, which can generate a surplus of at least Rs.95000 in the initial year, is of course, a good investment proposition. The above result is true for a cost of capital 12% and the annual growth of surplus of revenues over expenditure @ 10% per annum. Other values given in the table are interpreted similarly.

BLICKER HUNTER DISTRICT : THUNDERBIRD



**SEVAIN NALA
RURAL MARKET**

BLOCK BUXA

DISTRICT JAUNPUR

I. LOCATION OF THE SEVAIN NALA MARKET

Sevain Nala market is held daily. It is located at a distance of 12 kms. on Jaunpur-Gazipur road. The hinterland of this market consists of around thirty-three (33) nearby villages as shown under:

Name of the Village	Distance from the Market (in kms.)
1. Kirthapur	0.00
2. Karmahi	1.00
3. Ratipur	1.00
4. Pindra	2.00
5. Gosaipuri	2.00
6. Raipur	3.00
7. Udhokchaukiya	2.00
8. Imlo	5.00
9. Samopur	6.00
10. Calenderpur	6.00
11. Sultanpur	5.00
12. Bahrajpur	5.00
13. Kadipur	3.00
14. Mahmadpur Kandh	5.00
15. Pauna	3.00
16. Saraya	1.00
17. Anantpur	1.00
18. Utargava	1.00
19. Samaisa	3.00
20. Pahatiya	2.00
21. Tarsan	3.00

22. Baleymau	1.50
23. Kutchmutch	2.00
24. Ikauna	2.00
25. Narsan	3.00
26. Rajeypur	2.50
27. Gopalpur	1.50
28. Kauva Parey	2.50
29. Baghanbra	2.00
30. Gajna	1.00
31. Mohuddinpur	5.00
32. Kodda	4.00
33. Itaili	3.00

II. STRUCTURE OF THE MARKET

The research team of our Institute counted the shops of different commodities on a market day. It was found that there are 82 shops, consisting of 60 shops of vegetables, 5 of fruits, 7 of meat, fish and 10 shops of small eatables. The female shop owners are 11, comprising of 10 shops of vegetables and 1 shop of fruits. Thus, the size of Sevain Nala market is small in comparison with other rural markets of district Jaunpur. Since most of the shops are of vegetables, it was observed in the market and later became evident from the data that this market specializes in seasonal vegetables. In Table-1, structure of Sevain Nala market has been shown.

Table-1 : Structure of the Sevain Nala Market

COMMODITIES	TOTAL SHOPS			PERCENTAGE OF TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	50(83.33)	10(16.67)	60(100.0)	70.42	90.91	73.17
Fruits	4(80.00)	1(20.00)	5(100.0)	5.63	9.09	6.10
Meat and Fish	7(100.00)	--	7(100.0)	9.86	--	8.54
Small eatables	10(100.00)	--	10(100.0)	14.08	--	12.20
Total	71(86.59)	11(13.41)	82(100.0)	100.00	100.00	100.0

Note : Figures in brackets indicate percentage.

Source: Based on field data.

III. SAMPLE OF THE MARKET

As mentioned above, the size of Sevain Nala market is small. Out of the total 82 shops of market, 20 shops were selected as a sample shops for detailed study. In these 20 shops, 18 are vegetables shop and 2 are of fruits.

The female participation in this market is also not much. Therefore, only 2 female vegetables sellers were included in the sample. The Table 1.1 shows the sample structure of the market.

Table-1.1 : Sample of the Market

COMMODITIES	SELECTED SAMPLE SHOPS			PERCENTAGE OF SAMPLE SHOPS IN TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	16(88.89)	2(11.11)	18(100.00)	32.00	20.00	30.00
Fruits	2 (100.00)	--	2 (100.00)	50.00	--	40.00
Total	18(90.00)	2(10.00)	20(100.00)	33.33	18.18	30.77

Note : Figures in brackets indicate percentage.

Source: Based on field data.

IV. COMPOSITION OF THE MARKET

As evident from Table-2 that proportion of farmers (48 per cent) as sellers of different commodities has been found to be lower than that of traders (52 per cent) in the market. While all sellers of non-agricultural commodities are traders, majority of vegetables sellers (63 per cent) are farmers. Few farmers also sell fruits while most of fruits sellers are traders.

Table-2: Farmers and Traders Composition in the Sevain Nala Market

Commodities	Farmers	Traders	Total
Vegetables	38(63.33)	22(36.67)	60(100.00)
Fruits	1(20.00)	4(80.00)	5(100.00)
Meat and Fish	--	7(100.00)	7(100.00)
Small eatables	--	10(100.0)	10(100.00)
Total	39(47.56)	43(52.44)	82 (100.00)

Note : Figures in brackets indicate percentage.

Source : Based on field data.

V. COMPOSITION OF THE SAMPLE

Since the size of this market has been found to be small, the sample selected is also small, comprising of 12 farmers and 8 traders. In the sample, 12 farmers selling vegetables have been taken, while 6 traders of vegetables and 2 of fruits are in the sample. In Table-3, farmers-traders composition in the sample has been presented.

Table-3: Farmers and Traders Composition in the Sample of Sevain Nala Market

Commodities	Farmers	Traders	Total
Vegetables	12(66.67)	6(33.33)	18(100.00)
Gur	--	2(100.00)	2(100.00)
Total	12(60.00)	8(40.00)	20(100.00)

Source : Based on field data

VI. TURN OVER OF AGRICULTURAL PRODUCE IN SEVAIN NALA MARKET

The Sevain Nala rural market is primarily the market of agricultural produce because out of the total 82 shops on a market day, vegetables and fruits shops are 65. The data collected from the sample shops showed that on an average 42 kgs. of all agricultural produce is sold per shop per market day. It is evident that 45 kgs. of vegetables and 13 kgs of fruits are sold per shop per market day. On this basis, total quantity sold by per shop per market day came to 2696 kgs., 63 kgs and 2759 kgs. of vegetables, fruits and all agricultural produce respectively as shown in Table-4.

Table-4: Actual Turn Over of Agricultural Produce in Sevain Nala Market

Commodities	No. of Shops in the Sample	Total Qty. Sold per Market Day by Sample Shops (Kg.)	Average Qty. sold per sample shop per market day (Kg.)	No. of Total shops in the market	Total Qty. sold by all shops per market day (Kg.)
Vegetables	18	809	44.94	60	2696.40
Fruits	2	25	12.50	5	62.50
All Agricultural Produce	20	834	41.70	65	2758.90

Source : Based on field data.

One of the conditions for rural market selection for feasibility study, as set by UPDASP in ToR, is that the selected market should have at present, or within 4-5 years, annual turnover of more than 1000 MT of all agricultural produce. This pre-condition is met in case of selection of Sevain Nala rural market for feasibility study because our estimate as shown in Table-5 which is based on primary data collected from the sample farmers/traders indicated that this market, at present, has annual turnover of 1007 MT of all agricultural produce. The annual turnover of vegetables and fruits has been estimated to be 984 MT and 23 MT respectively.

Table-5 : Annual Turn Over of All Agricultural Produce in the Sevain Nala Market

Commodities	Turn Over (MT)
Vegetables	984.19
Fruits	22.81
All Agricultural Produce	1007.00

Source : Based on field data.

VII. PERSONS INVOLVED IN BUYING AND SELLING

According to the data collected from sample farmers/traders of Sevain Nala market, approximately one person per shop per market day has been found to be

involved in selling. It reflects from the Table-6 that on an average 26 persons purchase per shop on a market day. Thus, a total of 1827 persons have been reported to be purchasing from all shops on a market day in Sevain Nala Market.

Table-6: Total and Average Number of Persons Involved in Selling and Buying Per Market Day in Sevain Nala Market

Commodities	No. of Persons Involved in Selling	Average No. of Persons Involved in Selling	Total No. of Persons Involved in Buying	Average No. of Persons Involved in Buying	(No.)
Vegetables	66	1.10	1384	23	
Fruits	5	1.00	90	18	
Meat, Fish	11	1.57	133	19	
Small eatables	12	1.20	220	22	
Total	94	1.15	1827	22	

Source : Based on field data.

VIII. PRESENT POTENTIAL OF MARKET FEE

The visit to market revealed that in Sevain Nala market, no fee is collected at present. However, it was estimated that Rs.82/- per market day can be collected if a minimum amount of Re.1/- per shop per market day is levied as market fee. It can fetch annual revenue of Rs.29930 to the Gram Panchayat for upkeep of market. The following Table-7 shows the present revenue potential of market.

Table-7 : Present Potential of Market Fee in Sevain Nala Market

Commodities	Total Shops	Potential Market Fees per Market Day (Rs.)	Potential Market Fee Per Annum (Rs.)
Vegetables	60	60	21900
Fruits	5	5	1825
Meat, Fish	7	7	2555
Small Eatables	10	10	3650
Total	82	82	29930

Source : Based on field data.

IX. MODE OF TRANSPORT USED

The farmers/traders bringing the commodities for sale in the Sevain Nala market use two types of transport, namely cycle and bus/truck. As reported by them, 60 per cent use cycle as a means to carry their commodities in the market. The 20 per cent of them use bus/truck while remaining 20 per cent travel on foot. In Table-8, sample farmers/traders carrying their commodities for sale in Sevain Nala have been classified according to type of transport used by them.

Table-8: Traders Using Different Mode of Transport to Bring Agricultural Commodities

Commodities	Cycle	Bus/Truck	On Foot	(No.) Total
Vegetables	10(55.56)	4(22.22)	4(22.22)	18 (100.0)
Fruits	2(100.00)	--	--	2 (100.00)
Total	12(60.00)	4(20.00)	4(20.00)	20 (100.00)

Note : Figures given in brackets are percentage.

Source : Based on field data.

X. DISTANCE COVERED TO REACH THE MARKET

All the farmers/traders who come to this market travel an average distance of 1.80 kms. to reach the market. As evident in Table-9, around 80 per cent of them cover the distance of less than 3 kms. In this way, it appears that mostly the farmers/traders of nearby villages come to this market for sale of their commodities.

Table-9 : Classification of Sample Farmers/Traders According to the Distance Covered to reach the Sevain Nala Market

Commodities	No. of Traders/Farmers				Average Distance Covered (Km.)
	0-1 (km.)	1-3 (km.)	3+ (Km.)	Total	
Vegetables	5(27.78)	9(50.00)	4(22.22)	19(100.00)	1.83
Fruits	1 (50.00)	1(50.00)	--	2 (100.00)	1.50
Total	6(30.00)	10(50.00)	4(20.00)	20(100.00)	1.80

Note : Figures in brackets indicate percentage.

Source: Based on field data.

XI. EXISTING FACILITIES IN THE MARKET

It became evident from visit to the Sevain Nala market that vital infrastructural facilities are not there. Since the market is held on the sides of Jaunpur-Gazipur road, no facilities can be developed there. Only drinking water through a low bore hand pump is available but its quality is good. Therefore, this market is to be developed on alternative site.

XII. NEED OF IMPROVED FACILITIES

As explained above, market infrastructural facilities are lacking in Sevain Nala market.. Therefore, market is to be developed at new site, having all required facilities. The sample farmers/traders have also expressed their desire to have such facilities as evident from Table-10.

Table-10 : Need of Improved Marketing Facilities in Sevain Nala Market

Commodities	Total No. of Farmers Shops	No. of Farmers Shops requiring improved facilities	No. of farmers willing to pay higher market fee	Total No. of Traders shops	No. of traders shops requiring improved facilities	No. of traders willing to pay higher market fee
Vegetables	12	12(100.00)	12(100.00)	6	6(100.0)	6(100.00)
Fruits	--	--	--	2	2(100.0)	2(100.0)
Total	12	12	12	8	8(100.0)	8(100.00)

Note : Figures in brackets indicate percentage.
Source : Based on field data.

It becomes evident from the table that farmers/traders selling different commodities in the market need improved facilities and all of them are willing to pay reasonable market fee for using these facilities.

XIII. MARKETING FACILITIES REQUIRED

The farmers/traders of this market were encouraged to reveal on the basis of PRA that what type of facilities they need. The response given by them have been presented in Table-11. It reflected from the table that the facilities of drinking water, electricity, cycle stand, shed, platform and proper drainage are needed by most of the farmers/traders of this market. The female farmers/traders want to have drinking water, electricity, platform, toilet and proper drainage.

Table-11 : Type of Marketing Infrastructural Facilities Required by the Farmers/Traders of Sevain Nala Market

Commodities	Total No. of Farmers/traders	Place	Drin-king Water	Shed	Cycle Stand	Electricity	Plat-form	Stor-age	Toilet	Perm- anent shop	Proper drain-age
Vegetables	18	7 (38.89)	18 (100.0)	11 (61.11)	16 (88.89)	18 (100.0)	10 (55.56)	4 (22.22)	6 (33.33)	6 (33.33)	9 (50.00)
Male	16	6 (37.50)	18 (100.0)	10 (62.50)	16 (100.0)	16 (100.0)	8 (50.00)	4 (25.00)	4 (25.00)	5 (31.25)	7 (43.75)
Female	2	1 (50.00)	2 (100.0)	1 (50.00)	--	2 (100.0)	2 (100.0)	--	2 (100.0)	1 (50.00)	2 (100.0)
Fruits	2	1 (50.00)	2 (100.0)	1 (50.00)	2 (100.0)	2 (100.0)	1 (50.00)	1 (50.00)	1 (50.00)	2 (100.0)	2 (100.0)
Male	2	1 (50.00)	2 (100.0)	1 (50.00)	2 (100.0)	2 (100.0)	1 (50.00)	1 (50.00)	1 (50.00)	2 (100.0)	2 (100.0)
Female	-	--	--	--	--	--	--	--	--	--	--
Total	20	8 (40.00)	20 (100.0)	12 (60.00)	18 (90.00)	20 (100.0)	11 (55.00)	5 (25.00)	7 (35.00)	8 (40.00)	11 (55.00)
Male	18	7 (38.88)	18 (100.0)	11 (61.11)	18 (100.0)	18 (100.0)	9 (50.00)	5 (27.78)	5 (27.78)	7 (38.89)	9 (50.00)
Female	2	1 (50.00)	2 (100.0)	1 (50.00)	--	2 (100.0)	2 (100.0)	--	2 (100.0)	1 (50.00)	2 (100.0)

Note : Figures in brackets indicate percentage.

Source : Based on field data.

XIV. EXPECTED INCREASE IN ARRIVALS AFTER MARKET IMPROVEMENT

The above analysis has revealed the fact that (i) market infrastructural facilities are not there in the Sevain Nala market and (ii) farmers/traders of the market want to have improved facilities by paying market fee. It was estimated that how much increase in turnover of agricultural produce would result on account of provision of improved facilities in the market. The analysis has been carried out in Table-12. The analysis indicated that arrival of all agricultural commodities would go up by 198 per cent. The arrivals of vegetables would increase by 198 per cent and that of gur by 174 per cent. The increase in arrival will result on account of increase in present arrival and increase in arrival resulting from the new shops which will increase after market improvement.

Table-12: Expected Increase in Arrivals of Agricultural Produce After Market Improvement in the Sevain Nala Market

Commodities	Vegetables	Fruits	All Agricultural Produce
Number of Sample Shops	18	2	20
Total Qty. expected to be sold by sample shops per market day (Kg.)	1168	38	1206
Average Qty. expected to be sold by sample shops per market day (kg.)	64.89	19.00	60.30
Total No. of Shops in the market	60	5	65
Total Qty. Expected to be sold per market day in existing shops (kg.)	3893.40	95.00	3988.40
Expected increase in number of new Shops	64	4	68
Expected turnover of new entrants (kg.)	4152.96	76.00	4228.96
Total expected increase in turnover per market day (kg.)	8046.36	171.00	8217.36
Actual Qty. sold per market day (kg.)	2696.40	62.50	2758.90
Percentage Increase	198.41	173.60	197.85

Source : Based on field data.

XV. EVALUATION OF ECONOMIC BENEFITS EMANATING FROM MARKET IMPROVEMENTS IN THE SEVAIN NALA MARKET

Apart from channelizing fresh agriculture produce from farm level to final consumers there are other economic benefits which are likely to be generated in the process of market improvements. In fact, these benefits should be considered as an important factor and as a basis for taking up the task of Rural Market Improvement Programme. There are many economic benefits emanating from improved Rural Market infrastructure. These may broadly be grouped under following categories:

1. As an outcome of market improvements, the volume of turnover will increase. There is possibility that per unit market fee may also go up but this increase may not affect the net gains in view of increased volume of business.
2. Improved efficiency of market operations in the form of better product display, better facilities and availability of more marketing hours for the buyers and sellers result in higher per unit price of agricultural produce.
3. Reduction in spoilage of perishable crops; vegetables and fruits with the availability of improved rural marketing infrastructure.

It is very logical to put up the idea before a farmer/trader having shop in the market that for availing better market infrastructure they should bear higher market fee. For that matter, the shop owners (traders as well as farmers) have convincingly agreed to pay reasonable amount of market fee for availing improved market facilities. Besides, additional market fee would also be realized from the new farmers/traders who would join the market after its improvement.

For this matter, it was calculated in the financial analysis (Table-16) that how much market fee needs to be collected after the improvement of market in order to maintain the market viable. It became evident from financial analysis that for the viability of this market, Rs.2.58 per shop per market day should be collected from farmers/traders of Sevain Nala market. In this way, a total of Rs.387/- per market day should, at least be, collected as shown in the Table-13.

Table-13 : Potential Market Fee and Increased Market Fee Expected to be paid by Farmers/Traders of Sevain Nala Market

Commodities	No. of Sample Shops at Present	Present Potential Market Fee Collection from Total No. of Shops (Per Market Day) (Rs.)	Expected Total No. of Shops after Market Improvement (No.)	Total increased market fee required for market improvement (Per Market Day)
Vegetables	60	60	124	319.92
Fruits	5	5	9	23.22
Meat and Fish	7	7	7	18.06
Small eatables	10	10	10	25.80
Total	82	82	150	387.00

Source : Based on field data

The table shows that the present fee potential of the market has been estimated to be Rs.82/- per market day on the basis of levying a minimum amount of Re.1/- per shop per market day. The increase in the number of shops is estimated to be 150 after the improvement of market and on viability consideration, Rs.2.58 per shop per market day is required to be collected after market improvement and hence Rs.387 per annum.

The farmers/traders have also expressed their view to easily pay Rs.2.58 per market day after the development of this market at new site.

However, due to levy of Rs.2.58 per shop per market day, the per unit market cost of commodities sold in the new market would increase by 100 per cent. The estimated per unit market cost on the basis of present fee potential in the market is Re.0.02 which will increase to Re.0.04 after market improvement as shown in Table-14.

Table-14 : Change in Marketing Cost Before and After Market Improvement

Commodities	Present Market Turn Over of Sample Shops (Per Market Day) (Kg.)	Total Market Fee Potential of Sample Shops (Per Market Day) (Rs.)	Expected Market Turn-over after market improvement in sample shops (Kg.)	Total Expected Collection as Market Fee from Sample Shops (Rs.)	Percentage Increase in Fee Collection after Market Improvement (Rs.)	% Increase in Per Unit Marketing Cost (Rs.)
Vegetables	809	18(0.02)	1168	46.44(0.04)	158.00	100.00
Fruits	25	2(0.08)	38	5.16(0.14)	158.00	75.00
All Agricultural Produce	834	20(0.02)	1206	51.60(0.04)	158.00	100.00

Note : Figures in bracket show per unit marketing cost.

Source : Based on field data

Thus, it becomes evident that after the development of Sevain Nala market, the volume of business would increase in the market, at the same time, per unit market cost would also go up. But the increase would not be much and can be easily born by the farmer/traders of the market in view of increase in the volume of trade.

As a result of development of improved facilities in Sevain Nala market, the farmers/traders are expected to maintain the quality of their produce to be sold in the market. In other words, they will be able to bring their produce in this market in more presentable manner. Buyers will also feel satisfied while purchasing the commodities under improved market conditions. Hence, the sellers can easily justify at least 5 per cent increase in the prices of their produce. Since the increase in per unit marketing cost would not be significant, this hike in price would be a net gain to sellers of agricultural produce in the new market as the estimated in following Table-15.

Table-15 : Estimation of Net Gain in Marketing Under Market Improvement

Commodities	Estimated Total Value of Commodities sold per market at present (Rs.)	Estimated value of commodities to be sold per market day after market improvements (at current prices) (Rs.)	Estimated value of commodities to be sold after market improvement at 5% higher prices	Net gain per market day	Net gain per annum (Approx.) (Rs.)
Vegetables	6741	20115.90	21121.70	1005.80	367117.00
Fruits	687.5	1881.00	1975.05	94.05	34328.25
All Agricultural produce	7428.50	21996.90	23096.75	1099.85	401445.25

Source : Based on field data.

Other indirect economic benefits are also involved in the process of efficient marketing system. A transparent and efficient system, as suggested for Sevain Nala

market, will reduce the interference of middlemen and brokers in the determination of agriculture and other produce prices in the market. This will result into the direct benefit to farmers/traders on account of increased prices. This gain may lead to expansion of agricultural activities, resulting in higher production in the hinterland of Sevain Nala market.

Erection of marketing infrastructural facilities in Sevain Nala market may provide special benefit in the trading of perishable produce like vegetables, fruits and meat. In case of vegetables, fruits and meats, availability of facilities like watershed, light and storage may reduce at least 20 per cent spoilage of arrivals in the Sevain Nala market.

The proportion of vegetables in total market turn over of agricultural produce comes high in Sevain Nala market. It is expected to go higher with the availability of above listed infrastructural facilities. In case of fruits, the spoilage rate is found to be over 40 per cent during the peak season in this market.

With the availability of watershed and storage, the spoilage rate under such conditions may go down to less than 20 per cent. In case of meat and fish marketing, the availability of better infrastructural facilities will reduce the spoilage of these produce to a considerable extent. Apart from this, the hygienic conditions will also be maintained with the availability of these facilities in the market. Under the ordinary conditions the spoilage of fruits and meat products is 20 to 30 per cent and it could be reduced to 15 to 10 per cent with the availability of required infrastructural facilities in Sevain Nala market.

XVI. FINANCIAL AND ECONOMIC APPRAISAL OF INVESTMENT IN RURAL MARKET OF SEVAIN NALA

Introduction

Rural markets are a hub-centre of socio-economic activities in a region. Along with public services such as Primary Health Centre, Veterinary Hospital, Post Office, Bank, Educational Institutions, Play Ground, PCO, Police Station, etc., they provide a fillip to the tempo of social, cultural and economic growth of the region comprising of a number of villages from where buyers and sellers of goods and services are attracted to these markets.

Existing conditions in some such markets are far from satisfactory. A typical market may consist of some 200 stalls of a temporary nature and sellers sit on ground and on chabutras of houses and shops, open to sky without any shed or cover. Quite often they are held once, twice or thrice a week during the afternoon hours. Some may be the daily markets also.

The products traded in such markets include vegetables, fruits, edible oil, spices, jaggery, foodgrains, meat, fish, ready made wears, chappals, sweets, chhats, general goods and services of cobblers, smiths, barbers, etc. Arrival of commodities in the market fluctuates, depending upon the season and other factors.

Catchment area of such rural markets comprises of a large number of smaller and big villages in the vicinity of the village where the market is held. Total catchment area of such markets may cover a distance of some 6-8 kms. comprising of 10-15 villages or even more.

The following are some of the important infrastructure and public utilities usually required in such markets:

1. Pucca open platforms
2. Shaded platforms
3. Pucca Shops
4. Space for Market Information Centre and Office for Market Management Committee
5. Room for Security Guard
6. Place for parking of cycles, scooters, buggies, horse-carts, tractor-trolleys, etc.
7. Storage facility
8. Electrification
9. Drainage facility
10. Boundary wall and Fencing around the haat area with the gates
11. Construction of Roads
12. Cattle Shed with drinking water facilities
13. Drinking water
14. Toilets
15. Place for waste disposal
16. Plantation of trees

Management of the Market

Quite often the rural market is managed by the Gram Panchayat which realizes 'Tehbazar' from the traders. Another alternative arrangement is that the contract is awarded to a contractor for a stipulated amount per period and the contractor collects

Tehbazari from the shopkeepers at predetermined rates. Gram Panchayat may form a "Market Management Committee" (MMC) to monitor the various activities of the market. The committee may take decisions on the mode of maintenance, management, rate of Tehbazari, method of its realization and settlement of disputes related to the market.

Construction of a market with covered and open pucca platforms, fencing around the area and facilities for storage, toilets, water supply, proper drainage and parking, etc. can bring about an improvement in the conditions in such rural markets. Shopkeepers are willing to pay the 'Tehbazari' at higher rates provided proper facilities are developed.

Financial Analysis of Investment in Infrastructure

Initial investment is required on land and on capital cost involved in the creation of infrastructural facilities described above. Land for rural market could be the land owned by the Gram Panchayat, so that no investment is required to be made on this count.

Upkeep of the infrastructure is a must for the sustainability and trouble-free services. Below we provide estimates of expenditure (both capital and revenue type) required to be made in Sevain Nala market located in Dharampur Block of Jaunpur District, for which this feasibility study is being carried out (For details of the mathematical approach involved in this, see the Appendix given at the end).

XVII. FINANCIAL ANALYSIS OF PROPOSED

INVESTMENT IN SEVAIN NALA MARKET

Here we evaluate financial viability for providing facilities for the improvement of infrastructural facilities and other amenities in the rural market of Sevain Nala. Parameters involved in the financial analysis are detailed below:

1. Initial Capital Investment

Since the Sevain Nala market, at present, lacks infrastructural facilities therefore substantial amount will have to be spent on the modernisation of the market. Platform/sheds need to be constructed, water supply is to be arranged and other infrastructural facilities are to be provided. All this would require capital expenditure. According to our estimate, Rs.10,00,000/- would be needed as initial capital, which will have to be spent over a time span of one year. This may be termed as initial capital investment. We also assume that the entire capital investment will be made instantaneously at the beginning of the year. This is not an unrealistic assumption.

2. Life Span of the Project

The market infrastructural facilities proposed to be provided in the Sevain Nala market would have usefulness for a fairly long period of time though depreciation is bound to take place with the passage of time. The actual life span of the project cannot be estimated with high degree of accuracy but on the basis of technical opinion of the Architect/Civil Engineer, it is assumed that the facilities proposed to be provided would last for a period of at least 15 years. It may not be unrealistic to assume that the

facilities provided would remain useful even for a period of 20 years and above. In case of Sevain Nala market, we have taken the life span of the project to be 15 years. Thus, scrap value of the initial infrastructural facilities created at a cost of Rs.10,00,000 has been treated as 30% of the initial capital cost, i.e. Rs.3,00,000.

3. Cost of the Capital

Cost of the capital for project is a critical factor, which determines the viability of project. Cost of capital based on the competitive interest rates prevailing in the market would be too high if considered for this market. For socially desirable activities, it is even worthwhile to examine the financial viability at a relatively lower cost of capital. In practice also, the agencies involved in financing socially desirable activities encourage development of infrastructural facilities at a lower rate of capital cost. The projects so financed have plethora of social benefits, apart from financial benefits emanating from the project financed.

Keeping all this in view, 12 per cent annual cost of capital has been considered in the financial analysis of the Sevain Nala Market.

4. Cost of Repair and Maintenance

The proposed facilities to be provided in the market are bound to depreciate over the passage of time. Proper maintenance and upkeep of facilities in good condition is a social as well as economic necessity.

Keeping this objective in view, adequate provision has been made to account for the cost likely to arise on account of repair and maintenance. Items of expenditure under this head are as follows:

- a. Expenditure on labour, materials and overheads for repair and maintenance of facilities;
- b. Repair/Replacement of water pumps, electrical equipments and accessories etc. from time to time;
- c. Salaries and wages payable to persons employed for the upkeep of facilities created by the project.

Details of annual maintenance expenditure are as follows:

1.	Watchman for Security @ Rs.1500 per month	Rs.18,000
2.	Sweeper for cleaning for 365 days @ Rs.40 per day	Rs.14,600
3.	Electrical Maintenance for 365 days @ Rs.100 per day	Rs.36,500
4.	Maintenance of Handpump	Rs. 1,000
<hr/> Total		Rs.70,100

The above expenditure is expected to increase @ 5% annually.

Technical estimates suggest that there would be zero expenditure on repair and maintenance of the project during the first year. It is assumed that during second and third years, 2 per cent of the initial investment would be required for repair and maintenance. During the years 4 to 7, this will be 3% of the initial investment and thereafter @ 5 per cent of the initial capital investment will be needed for repair and maintenance of civil work and other infrastructural facilities till 15th year.

5. Revenues Arising from the Market

The completion of the market improvement programme would result into substantial improvement in the working conditions of the Sevain Nala market. Farmers and traders would get a sizeable and respectable place to sit in and transact the business. They would be saved from the inconvenience arising due to limited space, open sale and bad weather. There is always a good-will value associated with a good looking shop.

As a result of improved facilities in the market, it is expected that on account of availability of improved facilities, the users of market would be willing to pay an increased market fee and rent for using these facilities.

Views of farmers/traders were solicited on the required increase in the market fee recoverable from them after market improvement programme is carried out. Incremental increase in revenue due to creation of infrastructural facilities has been put at Rs.1,41,400 in the initial year. This is expected to go up @ 10% per annum.

NPV (Net Present Value) of Investments in the Projects

Based on the assumptions stated above, the sources of cash inflows and outflows are as follows:

Inflows

- a. Expected increase in revenue (Beginning at Rs.1,41,400 per annum and going up @ 10% per annum)
- b. Terminal value of initial investment (after 15 years from now) (30% of initial capital cost)

Outflows

- c. Initial capital cost (Rs.10,00,000)
- d. Cost of Repair and Maintenance (Rs.33560 in the initial year and expected to increase @ 5% per annum)
- e. Cost of maintenance of civil work and other infrastructural facilities (2% of capital cost in years 2 and 3, 3% in years 4 to 7, and 5% from years 8 onwards).

**Table 16: Computation of NPV and IRR on the basis of Expected Cash Flows
(Financial Point of View)**

Year	Addl Revenue Generated (based on increase @ 10% p.a.)	Terminal Value	Initial Capital Cost	Cost of Repair & Maintenance (based on increase @ 5% p.a.)	Rate of Increase in the Maintenance cost of civil work	Cost of Maintenance of Civil Work (based @ 2% of initial investment in years 2&3 and 5% thereafter)	Net Cash Flow
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
0			1000000				(100000)
1							0
2	141400			33560	0.02	20000	87840
3	155540			35238	0.02	20000	100302
4	171094			37000	0.03	30000	104094
5	188203			38850	0.03	30000	119354
6	207024			40792	0.03	30000	136231
7	227726			42832	0.03	30000	154894
8	250499			44974	0.05	50000	155525
9	275549			47222	0.05	50000	178326
10	303103			49583	0.05	50000	203520
11	333414			52063	0.05	50000	231351
12	366755			54666	0.05	50000	262089
13	403431			57399	0.05	50000	296032
14	443774			60269	0.05	50000	333505
15	488151	300000		63282	0.05	50000	674869

NPV = 190; IRR = 12% per annum

Based on a cost of capita of 12%, the NPV of the project is Rs.190. However, with changes in the cost of capital, the NPV of the project is as follows:

Table 17: Impact of Changes in Cost of Capital on Net Present Value

Cost of Capital	NPV (in Rs.)
0.06	669881
0.08	394848
0.10	175919
0.12	190
0.14	(142016)
0.15	(202909)
0.16	(258015)

Additional revenue arising due to the proposed investment on infrastructural facilities is required to be Rs.1,41,400 per annum in the initial year. However, if this falls short of the expectations, NPV becomes negative. In the tables below, the NPV and IRR are given for different amounts of additional revenue generated in the initial year ranging from Rs.140000 to as high as Rs.190000 along with the rates of growth in the revenues ranging from 5% per annum to 20% per annum.

Table 18 : Table Giving NPV at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)						
	140000	150000	160000	170000	180000	190000	
0.05	(344961)	(269085)	(193209)	(117333)	(41458)	34418	
0.06	(287693)	(207727)	(127761)	(47794)	32172	112139	
0.08	(160373)	(71312)	17748	106809	195870	284930	
0.10	(13744)	85790	185324	284858	384392	483927	
0.12	155277	266884	378491	490098	601705	713313	
0.14	350252	475786	601320	726854	852388	977922	
0.15	458733	592016	725299	858581	991864	1125147	
0.20	1135201	1316803	1498405	1680006	1861608	2043210	

Table 19 : Table Giving IRR at Various Levels of Revenues of the Initial Year and Various Rates of Growth

	Revenue of the Initial Year (in Rs.)						
	140000	150000	160000	170000	180000	190000	
Rate of Growth in Revenues	0.05	0.065	0.078	0.091	0.103	0.114	0.125
	0.06	0.076	0.089	0.101	0.113	0.124	0.135
	0.08	0.098	0.110	0.122	0.134	0.145	0.156
	0.10	0.118	0.131	0.142	0.154	0.165	0.175
	0.12	0.138	0.150	0.162	0.173	0.184	0.194
	0.14	0.157	0.169	0.181	0.192	0.203	0.213
	0.15	0.167	0.179	0.190	0.201	0.212	0.222
	0.20	0.213	0.224	0.236	0.247	0.257	0.267

Accumulations in the Sinking Fund

Surpluses of revenues over expenditure can be used for further expansion of facilities in the market and for providing additional facilities to sellers and buyers. These funds can be invested in safe and profitable investment avenues with a view to get a lump sum amount of money which can be used for replacement of infrastructural facilities when they get decayed and outdated. The deposits in the fund are expected to be as follows, depending upon the rate of interest earned on investments:

Table 20: Table giving accumulated value of Deposits made in the Sinking Fund at Different Rates of Interest, as at the end of 15 years

Rate of Interest	Revenue of the Initial Year (Rs. in Lakh)					
	140000	150000	160000	170000	180000	190000
0.08	43.64	47.95	52.25	56.55	60.85	65.15
0.09	45.96	50.52	55.07	59.63	64.19	68.75
0.10	48.44	53.28	58.11	62.94	67.78	72.61
0.11	51.11	56.24	61.37	66.50	71.63	76.76
0.12	53.98	59.43	64.88	70.33	75.78	81.22
0.13	57.07	62.86	68.65	74.44	80.23	86.02
0.14	60.38	66.54	72.70	78.86	85.02	91.18
0.15	63.94	70.50	77.05	83.61	90.17	96.72

ECONOMIC ANALYSIS

The following intangible benefits of the investment are particularly noteworthy:

1. Increase in the value of transactions carried out in the market
2. Benefits for women
3. Technology dissemination and technology development
4. Reduction in spoilage
5. Dissemination of market intelligence
6. Encouragement in the trade of agricultural and horticultural produce

As is quite obvious, if we take into consideration the impact of the above mentioned intangible factors on the NPV or IRR of the project, then investment on infrastructure in a rural market becomes a highly profitable proposition. Detailed calculations incorporating various aspects of social cost benefit analysis have not been carried out.

We have considered in this study the financial dimensions of the project and have gathered information relating to financial viability. Ultimate success of the project would depend on how imaginatively the project is managed in all its aspects. In this regard, sound financial management is of great importance.

There are considerable moral and cultural benefits accruing from the investment. Such investment cannot be looked as an instrument merely for solving the problems of poverty and backwardness. The real contribution of the investment is in terms of enhancing the quality of life of the people in the region. The project would be advantageous from different view points.

Some such non-tangible benefits accruing from investment in the project are detailed below:

1. Markets are held under unhygienic conditions as at present. Food articles, vegetables are kept under exposed conditions and become carriers of diseases and ailments. The project would create healthy and hygienic conditions and thereby the physical well being of the people would be improved.
2. Market is a place of social interaction. It is a venue where people belonging to the region converge for a day or two in a week and buy articles of daily consumption.

Improved condition in the market enables people to buy good quality products and thus the quality of life would be improved.

3. Political and social reform activities are conducted through these markets. Improved conditions in the market would attract more and more people to come to the market and derive benefits.
4. Improved conditions in the market could lead to increased business activities and increased arrival of articles of consumption. More business transactions would be carried out through the market and consequently more employment as well as income generation opportunities would be opened up.
5. Consciousness about new products and technology, etc. would be spread through the market. This would lead to improvement in the living standards of people. Companies can launch new products and processes suited for local consumption through these markets.
6. Climatic conditions reach extreme level during summer, winter and rainy seasons. Conditions become extremely bad particularly during the rainy season and the arrivals of articles is adversely affected. During summer also, when temperature level reaches high, it becomes very difficult both for the traders as well as the customers to visit the market. During winter season also, chilly winds prevent customers and traders to visit the market. Improved conditions would increase the number of days during which the markets are held.
7. When markets are not held regularly or when customers do not arrive in adequate numbers, agricultural produce particularly the perishable vegetables get spoiled or

they have to be sold at low price resulting into loss for the producers as well as consumers. Poor and vulnerable sections of the society are particularly harmed on account of poor conditions in the market.

8. Improvement in the market would lead to increased economic activity in the region. It would lead to more efficient and effective utilization of the natural as well as man-power resources available in the region.
9. Cultural activities would be encouraged through improved working conditions. Social welfare and reform activities can also be carried out more easily by improving the conditions in the market.

In a nutshell, the conditions in the market indicate the level of development of civilization. The investment under consideration is a contribution towards civilizational development and thus carries within it several non-financial and non-economic benefits.

If these are taken into consideration, the true value of NPV and IRR is much higher than has been computed in the study. This is shown in the table below. Here we have added an amount equal to 10% of the incremental trading caused due to generation of infrastructural facilities in the market. Savings caused due to reduction in spoilage @ 2% of the additional trading have also been added.

Table 21 : Computation of NPV and IRR on the basis of Economic Analysis

Cash Flow on the basis of Financial Analysis	Benefits of Increase in Trading	Benefit due to Reduction in Spoilage	Total Cash Flow
63900	40145	8029	112073
75475	42152	8430	126057
79983	44259	8852	133094
94365	46472	9294	150132
110379	48796	9759	168934
128198	51236	10247	189680
131211	53798	10760	195768
153229	56487	11297	221014
177684	59312	11862	248858
204830	62277	12455	279563
234951	65391	13078	313420
268355	68661	13732	350748
305385	72094	14419	391898
598418	75698	15140	689257
NPV = 366436; IRR = 17.040%			

WORDS OF CAUTION

Financial viability of the project depends primarily on :

1. Surplus of Revenue over expenses (Net Cash Flow); and
2. The cost of capital.

In the Table-22 given below, we have calculated the requirements of net cash flow based on different life spans of the project ranging between 15 to 40 years and on the basis of cost of capital ranging between 5% to 18% per annum for an initial investment of Rs.8,00,000 on the infrastructural facilities in the market. The results are

quite revealing in the sense that if the market fails to generate a minimum revenue as given in the table, the investment would not be financially viable proposition.

Table22 : Table Giving Equivalent Annual Cost for Different Life Span of the Project at Different Costs of Capital

Cost of Capital (k)	Life of Project (n) (in Years)					
	15	20	25	30	35	40
0.05	96342	80243	70952	65051	61072	58278
0.06	102963	87085	78227	72649	68974	66462
0.08	116830	101852	93679	88827	85803	83860
0.10	131474	117460	110168	106079	103690	102259
0.12	146824	133879	127500	124144	122317	121304
0.15	171017	159761	154699	152300	151135	150562
0.16	179358	168667	164013	161886	160892	160424
0.18	196403	186820	182919	181264	180550	180240

APPENDIXMATHEMATICAL APPROACH INVOLVED IN THE APPRAISAL OF
INVESTMENT ON INFRASTRUCTURE IN A RURAL MARKET

Let the initial investment on the development of infrastructural and public utilities in a market be Rs. 1. It takes about one year to complete the construction of the facilities and these are available for use after a period of one year since construction commences. It is assumed that incremental expenditure on maintenance of the facilities is incurred all at the end of every year and commences from the end of 2 years since construction starts. This same logic holds for incremental revenues also. The gap between incremental revenues and incremental expenditures (i.e. surplus of revenues over expenditures) is assumed to be Rs.X in the beginning (i.e. at the end of 2 years since construction etc. starts) and this increases in real term, @ g per annum. Useful life span of the initial investment is taken to be 14 years with an assumed depreciation @ 5% per annum simple, so that the terminal value of the infrastructural facilities created in the first year would remain to be 30% of the initial investment 1. Cost of capital is assumed to be 'k' per annum.

Based on the above logic,

$$I = \frac{X}{(1+k)(g-k)} \cdot \frac{\frac{1+g}{1+k}^{14} - 1}{[(1+k)^{15} - 0.30]} \quad X. \quad \text{and}$$

$$X = \frac{[(1+k)^{15} - 0.30] (1+k)(g-k)}{[(1+k)^{15} \left[\frac{(1+g)^{14}}{(1+k)^{14}} - 1 \right]]}$$

If k and g are assumed to be 12% and 10% respectively, the above expression becomes

$$I = 10.53 \cdot X \cdot (Bx), \text{ or equivalently}$$

$$X = 0.095 \cdot I \quad (\text{C.I})$$

If cost of capital (k) ranges between 6% to 15% and the growth in surplus (g) ranges between 5% to 20%, the following matrix giving the values of the coefficients involved in the above expression $X = .095 \cdot I$ is generated.

Table 23: Table giving the values of 'C' in the expression $X = C \cdot I$, at different rates of cost of capital and rates of growth

		$k = \text{Cost of capital}$					
		0.0600	0.0800	0.1000	0.1200	0.1400	0.1500
$g = \text{rate of growth in surplus of revenues over expenditures}$	0.0500	0.0746	0.0900	0.1067	0.1246	0.1437	0.1538
	0.0600	NA	0.0849	0.1009	0.1182	0.1367	0.1465
	0.0800	0.0620	NA	0.0901	0.1061	0.1234	0.1326
	0.1000	0.0546	0.0668	NA	0.0950	0.1110	0.1195
	0.1200	0.0479	0.0589	0.0712	NA	0.0995	0.1074
	0.1400	0.0419	0.0518	0.0629	0.0753	NA	0.0962
	0.1500	0.0392	0.0486	0.0591	0.0709	0.0840	NA
	0.2000	0.0277	0.0348	0.0429	0.0520	0.0624	0.0680

($X = \text{Surplus of revenue over expenditure required to be generated at the end of year 2}$, $I = \text{Initial capital outlay}$, $C = \text{Coefficient values computed on the basis of the assumptions stated in the model}$)

The above table acts as a ready reckoner to ascertain the amount of surplus of revenues over expenditures required to be generated on annual basis with a constant annual growth rate of 'g' and a given cost of capital 'k' in order to justify (on the grounds of financial viability) the initial investment of Rs.1 in a market. As an example, if initial capital outlay on a market is Rs.10 lakhs, then .095 X Rs.1000000= Rs.95000 is the annual surplus of revenues over expenditures which is required to be generated at the end of the initial year (i.e. year 2) in which facilities are made available for use. This should grow annually @ 10% per annum ($g=.10$) in order to make the project viable from financial point of view.

Reciprocals of the values given in the table 21 above, gives the values of B in the expression $I = BX$. Results are as follows:

Table 24: Table giving the values of 'B' in the expression $I = BX$ at different rates of cost of capital and rates of growth

g = rate of growth in surplus of revenues over expenditure	$k = \text{Cost of capital}$						
	0.06	0.08	0.10	0.12	0.14	0.15	
0.05	13.40	11.11	9.38	8.03	6.96	6.50	
0.06	NA	11.77	9.91	8.46	7.31	6.83	
0.08	16.13	NA	11.09	9.42	8.10	7.54	
0.10	18.32	14.98	NA	10.53	9.01	8.37	
0.12	20.88	16.97	14.05	NA	10.05	9.31	
0.14	23.85	19.29	15.89	13.28	NA	10.39	
0.15	25.52	20.58	16.91	14.10	11.91	NA	
0.20	36.04	28.73	23.32	19.21	16.03	14.71	

The above table acts as a ready reckoner to ascertain the maximum amount of capital investment, which should be made on the expectation of a given amount of surpluses of revenues over expenditures. As an example, if it is expected that a surplus of Rs.95000 can be generated in the initial year, then the investment will remain financially viable upto a maximum investment of $Rs.10.53 \times 95000 = Rs.10$ lakhs. An initial investment of an amount less than Rs.10 lakhs, which can generate a surplus of at least Rs.95000 in the initial year, is of course, a good investment proposition. The above result is true for a cost of capital 12% and the annual growth of surplus of revenues over expenditure @ 10% per annum. Other values given in the table are interpreted similarly.

**GORABADSHAHPUR
RURAL MARKET**

BLOCK SHAHGANJ

DISTRICT JAUNPUR

I. LOCATION OF THE GORABADSHAHPUR MARKET

Gorabadshahpur market is the bi-weekly market. Its market days are Tuesday and Saturday. To reach this market, one has to travel on Jaunpur-Azamgarh national highway upto 13 kms. from Jaunpur. The market is being held on the sides of highway. Being on the road sides, infrastructural facilities are not there. Gorabadshahpur gram panchayat which claims its ownership over this market, does not collect any fee from the sellers in market. However, Gram Panchayat has shown its eagerness to develop this market. Mahant Shivdas Udaseen of this village has agreed to give his land for the development of this market. Proposal has been sent to the District Project Coordinator, UPDASP, Jaunpur to develop this market at new site. The hinterland of this market consists of the following villages:

Name of the Village	Distance from the Market (in kms.)
1. Baruna	3.00
2. Bairi	2.50
3. Dasmado	2.00
4. Kodahra	1.50
5. Sakramau	1.00
6. Jeevli	1.00
7. Pilkhua	1.00
8. Kunbipur	1.00
9. Arra	3.00
10. Dudhaura	3.00
11. Pachaura	2.00
12. Jhaseypur	1.50

13. Sakhwalia	1.00
14. Daridiya	1.00
15. Kishanpur	1.00
16. Ekramganj	1.00
17. Lilaha	1.00
18. Keshavpur	3.00
19. Kabiruddinpur	2.00
20. Muskabad	2.50
21. Bithar	3.00
22. Chorsund	1.50
23. Dharsund	1.50
24. Kukuha	1.50
25. Tarsund	1.50
26. Kutchmutch	1.50
27. Baleymau	2.00
28. Kauapar	2.00
29. Rajeypur	2.00
30. Dashartha	1.50
31. Saraijan Chand	1.50
32. Mangrawa	2.00
33. Khodoria	2.00
34. Chakpedwa	2.50
35. Kurethu	1.50
36. Mera Dakhan	1.00
37. Bishunpur	2.50
38. Sonari	2.50
39. Pilkhini	2.00
40. Samaipur	2.00

II. STRUCTURE OF THE MARKET

The enumeration of shops on a market day by our research team revealed the fact that there are 282 shops of different commodities per market day in Gorabadshahpur market. Out of the total shops, 71 per cent shops are of vegetables and remaining shops are of foodgrains, gur, small eatables, meat, fish, clay pots, cosmetics, etc. The complete structure of Gorabadshahpur market has been shown in Table-1.

The table also shows that out of total shops, 16 per cent are owned by the females while rest 84 per cent owned by the males. The female shop owners are mostly involved in selling of vegetables, basket, clay pots, masala and cosmetics.

Table-1 : Structure of the Gorabadshahpur Market

COMMODITIES	TOTAL SHOPS			PERCENTAGE OF TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	180(90.00)	20(10.00)	200(100.00)	75.63	45.45	70.93
Foodgrains	5(100.00)	--	5(100.00)	2.10	--	1.77
Gur	12(80.00)	3(20.00)	15(100.00)	5.04	6.82	5.32
Fruits	4(80.00)	1(20.00)	5(100.00)	1.68	2.27	1.77
Masala	7(46.67)	8(53.33)	15(100.00)	2.94	18.20	5.32
Basket	--	5(100.00)	5(100.00)	--	11.36	1.77
Cobbler	4(100.00)	--	4(100.00)	1.68	--	1.42
Meat & Fish	9(100.00)	--	9(100.00)	3.78	--	3.20
Small eatable shops	15(100.00)	--	15(100.00)	6.30	--	5.32
Clay pots	2(40.00)	3(60.00)	5(100.00)	0.84	6.82	1.77
Cosmetics	--	4(100.00)	4(100.00)	--	9.10	1.42
Total	238(84.40)	44(15.60)	282(100.00)	100.00	100.00	100.0

Note : Figures in brackets indicate percentage.

Source: Based on field data.

III. SAMPLE OF THE MARKET

The sample selected for the study constitutes around 30 per cent of all shops of the market. Across different agricultural commodities, 30 per cent of vegetable, 40 per cent of foodgrains, 33 per cent of gur, 50 per cent of fruits and 26 per cent of masala shops have been included in the sample. The female shop owners have also been given due representation in the sample as evident in Table-1.1.

Table-1.1 : Sample of the Market

COMMODITIES	SELECTED SAMPLE SHOPS			PERCENTAGE OF SAMPLE SHOPS IN TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	52(88.14)	7(11.86)	59(100.0)	28.89	35.00	29.50
Foodgrains	2(100.0)	--	2(100.0)	40.00	--	40.00
Gur	4(80.00)	1(20.00)	5(100.0)	33.33	33.33	33.33
Fruits	2(100.0)	--	2(100.0)	50.00	--	50.00
Masala	3(75.00)	1(25.00)	4(100.0)	42.86	12.50	26.67
Total	63(87.50)	9(12.50)	72(100.00)	30.29	28.12	30.00

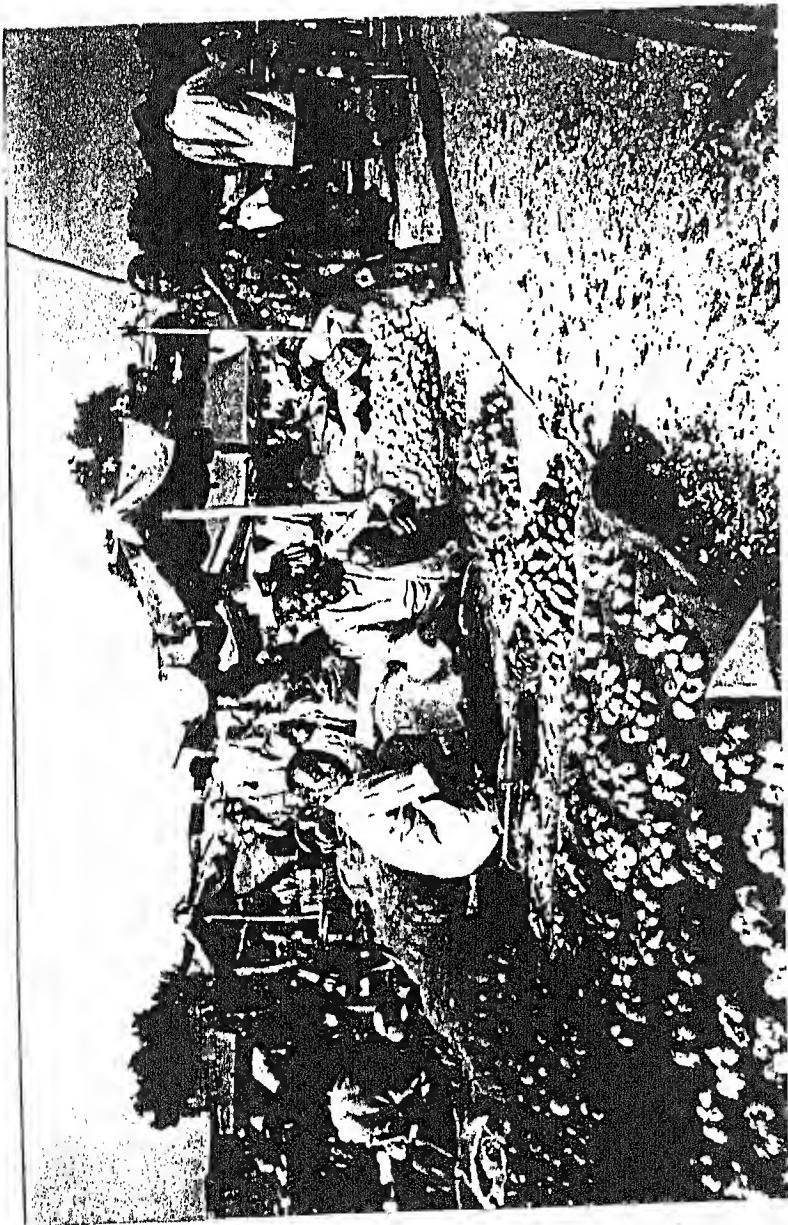
Note : Figures in brackets indicate percentage.

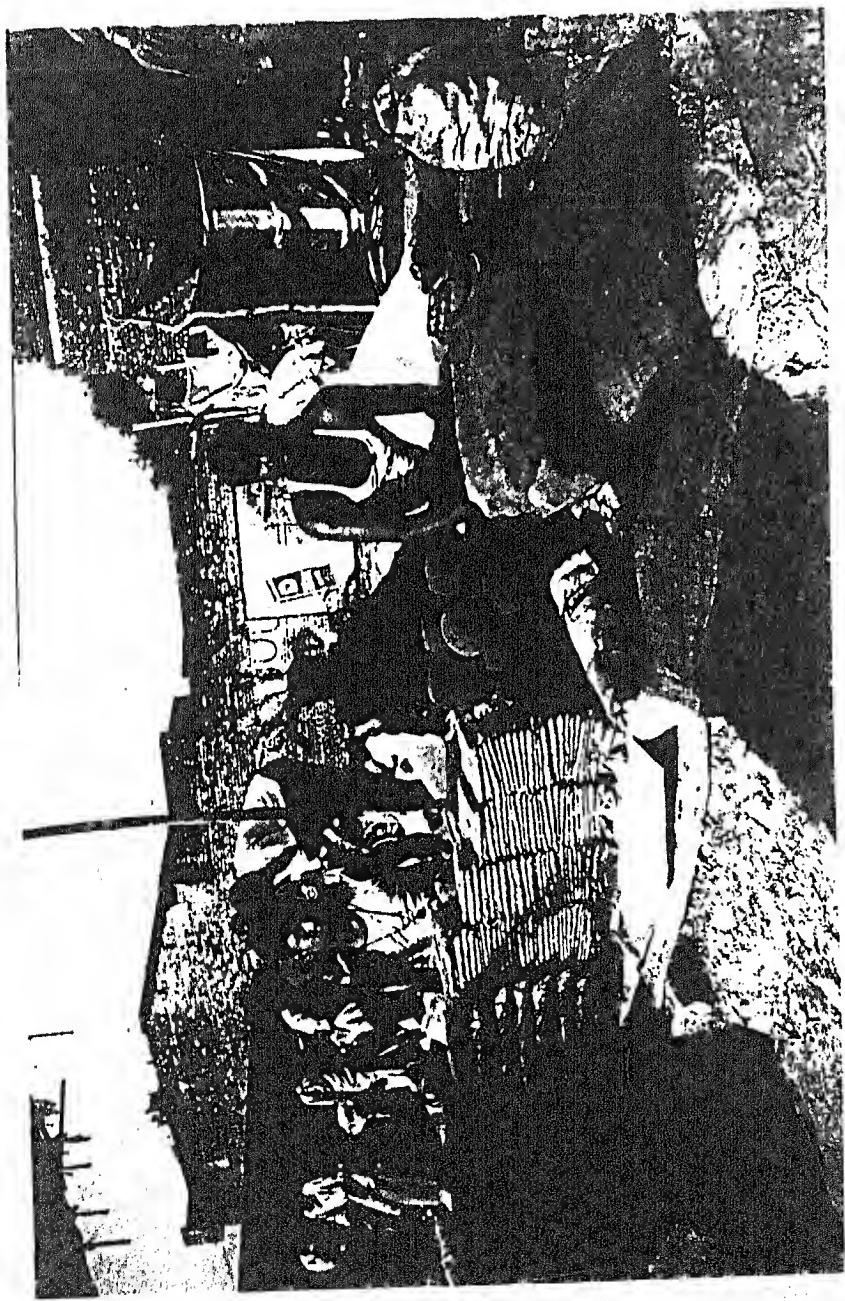
Source: Based on field data.

IV. COMPOSITION OF THE MARKET

The Table-2 shows that farmers and traders bring different commodities for sale in this market. It is evident that 59 per cent of total sellers are farmers and 41 per cent are traders. The majority of vegetables and foodgrains sellers have reported to be the farmers while the traders have been found to be involved in the sale of non-agricultural

Vegetable selling at Gaurabachan Pur (market)
OF JAUNPUR





Guru Shop at Gora Badghashpur Rural Market
in Jampur District.

items. The Table-2 shows the farmers/traders composition in the structure of Gorabadshahpur market.

Table-2: Farmers and Traders Composition in the Gorabadshahpur Market

Commodities	Farmers	Traders	Total
Vegetables	140(70.00)	60(30.00)	200(100.00)
Foodgrains	3(60.00)	2(40.00)	5(100.00)
Gur	5(33.33)	10(66.67)	15(100.00)
Fruits	3(60.00)	2(40.00)	5(100.00)
Masala	--	15(100.00)	15(100.00)
Basket	5(100.00)	--	5(100.00)
Cobbler	--	4(100.00)	4(100.00)
Meat & Fish	2(22.22)	7(77.78)	9(100.00)
Small eatable shops	4(26.67)	11(73.33)	15(100.00)
Clay pots	5(100.00)	--	5(100.00)
Cosmetics	--	--	4(100.00)
Total	167(59.22)	115(40.78)	282(100.00)

Note : Figures in brackets indicate percentage.

Source : Based on field data.

V. COMPOSITION OF THE SAMPLE

Keeping in view the composition of farmers and traders in sale of different commodities in Gorabadshahpur market, more than half (61 per cent) of the total farmers and less than half of the total traders (39 per cent) have been included in the sample of study. In case of vegetables and foodgrains, the proportionate representation has been given. The Table-3 shows the farmers and traders composition in the sample of Gorabadshahpur market.

Table-3: Farmers and Traders Composition In the Sample of Gorabadshahpur Market

Commodities	Farmers	Traders	Total
Vegetables	40(67.80)	19(32.20)	59(100.00)
Foodgrains	1(50.00)	1(50.00)	02(100.00)
Gur	1(20.00)	4(80.00)	05(100.00)
Fruits	2(100.00)	--	02(100.00)
Masala	--	4(100.00)	04(100.00)
Total	44(61.11)	28(38.89)	72 (100.00)

Source : Based on field data

VI. TURN OVER OF AGRICULTURAL PRODUCE IN GORABADSHAHPUR MARKET

The Gorabadshahpur market is the bi weekly market. The data collected from the sample farmers/traders showed that on an average 49 kgs. of vegetables, 23 kgs. of foodgrains, 24 kgs. of gur, 28 kgs. of fruits and 6 kgs. of masala are sold by each shop per market day. On this basis, the total quantity sold by all shops per market day comes to 10370 kgs. of all agricultural produce per market day as evident in Table-4.

Table-4: Actual Turn Over of Agricultural Produce in Gorabadshahpur Market

Commodities	No. of Shops in the Sample	Total Qty. Sold per Market Day by Sample Shops (Kg.)	Average Qty. sold per sample shop per market day (Kg.)	No. of Total shops in the market	Total Qty. sold by all shops per market day (Kg.)
Vegetables	59	2873	48.69	200	9739.00
Foodgrains	02	45	22.50	5	112.50
Gur	05	120	24.00	15	360.00
Fruits	02	55	27.50	5	137.50
Masala	04	18	4.50	15	67.50
All Agricultural Produce	72	3111	43.21	240	10370.00

Source : Based on field data.

One of the conditions, as mentioned in the Terms of Reference (ToR) of UPDASP for the selection of rural market for Feasibility Study is that the selected market should have or expected to have within 4-5 years the annual turnover of more than 1000 MT of all agricultural produce. This pre-condition of market selection is justified in case of Gorabadshahpur market because our estimate as shown in Table-5 indicates that this market has annual turnover of around 1078 MT per annum.

Table-5 : Annual Turn Over of All Agricultural Produce in the Gorabadshahpur Market

Commodities	Turn Over (MT)
Vegetables	1012.86
Foodgrains	11.70
Gur	37.44
Fruits	14.30
Masala	7.02
All Agricultural Produce	1078.48

Source : Based on field data.

VII. PERSONS INVOLVED IN BUYING AND SELLING

As per our enumeration, there are 282 shops of different commodities per market day in the Gorabadshahpur market. In all the shops, more than one person has been found to be involved in selling. As far purchasing is concerned, the estimate as shown in Table-6 indicated that on an average 23 persons purchase from each shop on a market day. The average number of buyers varies from 25 of vegetables to 12 of clay pots. The maximum number of 34 persons buy from each of the masala shops.

Table-6: Total and Average Number of Persons Involved in Selling and Buying Per Market Day in Gorabadshahpur Market

Commodities	No. of Persons Involved in Selling	Average No. of Persons Involved in Selling	Total No. of Persons Involved in Buying	Average No. of Persons Involved in Buying (No.)
Vegetables	220	1.10	5000.00	25
Foodgrains	05	1.00	80.00	16
Gur	15	1.00	288.00	19
Fruits	05	1.00	87.50	18
Masala	23	1.53	506.25	34
Basket	8	1.60	55.00	11
Cobbler	4	1.00	80.00	20
Meat & Fish	14	1.55	108.00	12
Small eatable shops	23	1.53	300.00	20
Clay pots	05	1.00	60.00	12
Cosmetics	04	1.00	56.00	14
Total	323	1.16	6621	23

Source : Based on field data.

VIII. REVENUE POTENTIAL OF THE MARKET

The Gorabadshahpur market is bi-weekly market and approximately 282 shops sell different commodities on each market day. However, no fee is levied on the sellers. It has been estimated that howmuch revenue could be obtained if Re.1/- as a minimum amount of fee, is levied per shop per market day. The exercise as shown in Table-7 shows that approximately Rs.29328 per annum can be generated from this market.

Table-7 : Present Potential of Market Fee in Gorabadshahpur Market

Commodities	Total Shops	Potential Market Fee per Market Day (Rs.)	Potential Market Fee Per Annum (Rs.)
Vegetables	220	220	20800
Foodgrains	05	05	520
Gur	15	15	1560
Fruits	05	05	520
Masala	23	23	1560
Basket	8	8	520
Cobbler	4	4	416
Meat & Fish	14	14	936
Small eatable shops	23	23	1560
Clay pots	05	05	520
Cosmetics	04	04	416
Total	282	282	29328

Source : Based on field data.

IX. MODE OF TRANSPORT USED

It has been reported by the sample farmers/traders that they use two types of transport to carry their commodities for sale in this market. It is evident that 75 per cent of them use cycle as a means of transport, while 15 per cent use rickshaw trolley. It has been reported that 10 per cent of them come to this market on foot. In Table-8, sample farmers/traders have been classified according to the means of transport used by them to bring different commodities for sale in this market.

Table-8: Traders Using Different Mode of Transport to Bring Agricultural Commodities

Commodities	Cycle	On Foot	Rickshaw/ Trolleys	Total (No.)
Vegetables	44(74.58)	5(8.47)	10(16.95)	59(100.00)
Foodgrains	2(100.00)	--	--	2(100.00)
Gur	3(60.00)	1(20.00)	1(20.00)	5(100.00)
Fruits	2(100.00)	--	--	2(100.00)
Masala	3(75.00)	1(25.00)	--	4(100.00)
Total	54(75.00)	7(9.72)	11(15.28)	72(100.00)

Note : Figures given in brackets are percentage.

Source : Based on field data.

X. DISTANCE COVERED TO REACH THE MARKET

The Gorabadshahpur market is important bi-weekly market of this area and its hinterland extends to around forty (40) villages. These villages are nearby to this market and farmers/traders cover on an average distance of 1.72 kms. to reach this market. It is also evident that all farmers/traders who come to this market for sale of their commodities travel upto 3 kms. only. The majority of farmers/traders of vegetables, foodgrains and other commodities as shown in Table-9 travel a distance of 1-3 kms. to reach this market.

Table-9 : Classification of Sample Farmers/Traders According to the Distance Covered to reach the Gorabadshahpur Market

Commodities	No. of Farmers/Traders			(No.)
	0-1 (km.)	1-3 (km.)	Total	Average Distance Covered (Km.)
Vegetables	25(42.37)	34(57.63)	59(100.00)	1.73
Foodgrains	1(50.00)	1(50.00)	2(100.00)	1.50
Gur	2(40.00)	3(60.00)	5(100.00)	1.40
Fruits	--	2(100.00)	2(100.00)	1.50
Masala	1(25.00)	3(75.00)	4(100.00)	2.12
Total	29(40.23)	43(59.72)	72(100.00)	1.72

Note : Figures in brackets indicate percentage.

Source: Based on field data.

XIII. EXISTING FACILITIES IN THE MARKET

As observed in the market that all necessary market infrastructural facilities are lacking in this market. Being on the highway, the traffic is heavy and at the same time, market becomes congested which causes inconvenience to sellers as well as buyers. Thus, no facility can be provided at the existing site.

XII. NEED OF IMPROVED FACILITIES

As observed above that the vital market infrastructural facilities are lacking there. Therefore, utmost need is to provide improved facilities at the new proposed site. The

farmers/traders of the market have also expressed their desire to have such facilities as evident from Table-10.

Table-10 : Need of Improved Marketing Facilities in Gorabadshahpur Market

Commodities	Total No. of Farmers Shops	No. of Farmers Shops requiring improved facilities	No. of farmers willing to pay higher market fee	Total No. of Traders shops	No. of traders shops requiring improved facilities	No. of traders willing to pay higher market fee
Vegetables	40	40(100.00)	40(100.00)	19	19(100.00)	19(100.00)
Foodgrains	01	1(100.00)	1(100.00)	01	01(100.00)	01(100.00)
Gur	01	1(100.00)	1(100.00)	04	01(100.00)	01(100.00)
Fruits	02	2(100.00)	2(100.00)	--	02(100.00)	02(100.00)
Masala	--	--	--	04	04(100.00)	04(100.00)
Total	44	44(100.00)	44(100.00)	28	28(100.00)	28(100.00)

Note : Figures in brackets indicate percentage.

Source : Based on field data

It becomes evident from the above table that farmers/traders of this market need improved facilities and all of them are willing to pay higher market fee for using the improved facilities.

XIII. TYPE OF MARKETING FACILITIES REQUIRED

The farmers/traders of the market were enquired on the basis of PRA that what type of facilities they need. The PRA was applied more rigorously in case of female

farmers/traders of the market. The views obtained from them have been presented in Table-11.

It becomes evident from the table that the facilities of place, drinking water, shed, road, platform, electricity, toilet, permanent shop and cycle stand are required by most of the farmers/traders of the market. The male as well as female farmers/traders both want to have these facilities.

Table-11 : Type of Marketing Infrastructural Facilities Required by the Farmers/Traders of Gorabadshahpur Market

Commodities	Total No. of Farmers/traders	Place	Drin-king Water	Shed	Road	Plat-form	Electri-city	Stor-age	Toilet	Perm-enan-t shop	Cycle stand	Proper drainage
Vegetables	59	32 (54.24)	59 (100.0)	40 (67.80)	51 (80.44)	31 (52.54)	59 (100.0)	20 (33.90)	45 (76.27)	48 (81.38)	48 (81.36)	38 (64.41)
Male	52	30 (57.69)	52 (100.0)	36 (69.23)	44 (84.62)	28 (53.85)	52 (100.0)	18 (34.62)	38 (73.08)	46 (88.46)	48 (92.31)	34 (65.38)
Female	07	2 (28.57)	7 (100.0)	4 (57.14)	7 (100.0)	3 (42.86)	7 (100.0)	2 (28.57)	7 (100.0)	2 (28.57)	-	4 (57.14)
Foodgrains	2	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)
Male	2	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)
Female	-	--	-	--	--	--	--	--	--	--	--	--
Gur	5	3 (60.00)	5 (100.0)	4 (80.00)	5 (100.0)	3 (60.00)	5 (100.0)	3 (60.00)	3 (60.00)	5 (100.0)	4 (80.00)	3 (60.00)
Male	4	2 (50.00)	4 (100.0)	3 (75.00)	4 (100.0)	5 (50.00)	4 (100.0)	2 (50.00)	2 (50.00)	4 (100.0)	4 (100.0)	2 (50.00)
Female	1	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	--	1 (100.0)
Fruits	2	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)
Male	2	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)	2 (100.0)
Female	-	--	-	--	--	--	--	--	--	--	--	--
Masala	4	3 (75.00)	4 (100.0)	3 (75.00)	4 (100.0)	4 (100.0)	4 (100.0)	3 (75.00)	2 (50.00)	4 (100.0)	3 (75.00)	2 (50.00)
Male	3	2 (66.67)	3 (100.0)	2 (66.67)	3 (100.0)	3 (100.0)	3 (100.0)	2 (66.67)	2 (66.67)	3 (100.0)	3 (100.0)	1 (33.33)
Female	1	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	1 (100.0)	-	1 (100.0)	--	1 (100.0)
Total	72	42 (58.33)	72 (100.0)	51 (70.83)	84 (88.89)	42 (58.33)	72 (100.0)	30 (41.67)	54 (75.00)	61 (84.72)	59 (81.94)	47 (66.28)
Male	63	38 (60.32)	63 (100.0)	45 (71.43)	56 (87.30)	37 (58.73)	63 (100.0)	26 (41.27)	46 (73.02)	57 (90.48)	59 (93.65)	41 (65.08)
Female	9	4 (44.44)	9 (100.0)	6 (66.67)	9 (100.0)	6 (56.56)	9 (100.0)	4 (44.44)	8 (88.89)	4 (44.44)	--	6 (66.67)

Note : Figures in brackets indicate percentage.

Source : Based on field data.

XIV. EXPECTED INCREASE IN ARRIVALS AFTER MARKET IMPROVEMENT

The analysis in the above section points out that (i) market infrastructural facilities are absent in the Gorabadshahpur market, and (ii) farmers/traders of this market want to have facilities at developed market. They are also ready to pay reasonable amount of market fee. Since the market is to be developed at new site, it is natural that the volume of trade would increase on account of developed market.

The analysis as carried in Table-12 shows that the arrival of agricultural commodities is expected to increase by around 52 per cent. The arrivals of vegetables would increase by 49 per cent, of foodgrains by 133 per cent, gur by 56 per cent, fruits by 142 per cent and masala by 48 per cent. This increase in arrival will come on account of increase in present arrival and increase in arrival resulting from the addition of shops in new market.

Table-12: Expected Increase in Arrivals of Agricultural Produce After Market Improvement in the Gorabadshahpur Market

Commodities	Vegetables	Food-grains	Gur	Fruits	Masala	All Agricultural Produce
Number of Sample Shops	59	2	5	2	4	72
Total Qty. expected to be sold by sample shops per market day (Kg.)	4047	75	165	95	25	4407
Average Qty. expected to be sold by sample shops per market day (kg.)	68.59	37.5	33.00	47.50	6.25	61.21
Total No. of Shops in the market	200	5	15	5	15	240
Total Qty. Expected to be sold per market day in existing shops (kg.)	13718.0	187.50	495.00	237.5	93.75	14690.40
Expected increase in number of new Shops	11	2	2	2	1	18
Expected turnover of new entrants (Kg.)	754.49	75.00	66.00	95.00	6.25	1101.78
Total expected increase in turnover per market day (kg.)	14472.49	262.50	561.00	332.50	100.00	15792.18
Actual Qty. sold per market day (kg.)	9739.00	112.50	360.00	137.50	67.50	10370.00
Percentage Increase	48.60	133.33	55.83	141.82	48.15	52.29

Source : Based on field data.

XV. EVALUATION OF ECONOMIC BENEFITS EMANATING FROM MARKET IMPROVEMENTS IN THE GORABADSHAHPUR MARKET

Apart from channelizing fresh agriculture produce from farm level to final consumers there are other economic benefits which are likely to be generated in the process of market improvements. In fact these benefits should be considered as an important factor and as a basis for taking up the task of Rural Market Improvement Programme. There are many economic benefits emanating from improved Rural Market infrastructure. These may broadly be grouped under following categories:

1. As an outcome of market improvements increased volume of trade results in comparatively lower or constant or higher per unit marketing cost.
2. Improved efficiency of market operations in the form of better product display, better facilities and availability of more marketing hours for the buyers and sellers result in higher per unit price of agricultural produce.
3. Reduction in spoilage of perishable crops; vegetables and fruits with the availability of improved rural marketing infrastructure.

It is very logical to put up the idea before a farmer/trader having shop in the market that for availing better market infrastructure they should bear higher market fee. For that matter, the shop owners (traders as well as farmers) have convincingly agreed to pay higher market fee for availing improved market facilities. Besides, additional market fee would also be realized from the new farmers/traders who would join the market after its improvement.

For this matter, it was calculated in the financial analysis (Table-16) that how much market fee is required to be collected after the improvement of market. This required collection in market fee has been determined on the viability consideration. It was found that Rs.4.72 per shop per market day is required to be collected. If this is taken as a base of fee collection after the development of Gorabadshahpur market, a total of Rs.1416 per market day is required to be collected as evident in Table-13.

Table-13 : Potential Market Fee and Increased Market Fee Expected to be paid by Farmers/Traders of Gorabadshahpur Market

Commodities	No. of Sample Shops at Present	Present Potential of Market Fee of Total Shops (Per Market Day) (Rs.)	Expected Total No. of Shops after Market Improvement (No.)	Total increased market fee required for market improvement (Per Market Day) (Rs.)
Vegetables	200	200	211	995.92
Foodgrains	5	5	7	33.04
Gur	15	15	17	80.24
Fruits	5	5	7	33.04
Masala	15	15	16	75.52
Basket	5	5	5	23.60
Cobbler	4	4	4	18.88
Meat & Fish	9	9	9	42.48
Small eatables	15	15	15	70.80
Clay pots	5	5	5	23.60
Cosmetics	4	4	4	18.89
Total	182	182	300	1416.00

Source : Based on field data

The above table shows that the present fee potential of the market can be estimated to be Rs.300 per market day on the basis of levying a minimum amount of Re.1/- per shop per market day. The expected increase in the number of shops is estimated to be 300 and for the viability of the market Rs.4.72 per shop per market day is to be collected. The farmers/traders have also expressed their ability to pay Rs.4.72 per market day as market fee.

However, due to realization of Rs.4.72 per shop per market day, the per unit market cost of the commodities sold in the market after market improvement would increase from Re.0.02 to Re.0.08 as shown in Table-14.

Table-14 : Change in Marketing Cost Before and After Market Improvement

Commodities	Present Market Turn Over of Sample Shops (Per Market Day) (Kg.)	Total Market Fee Potential of Sample Shops (Per Market Day) (Rs.)	Expected Market Turn-over after market improvement in sample shops (Kg.)	Total Required Collection as Market Fee from Sample Shops (Rs.)	Percentage Increase in Fee Collection after Market Improvement	% Increase in Per Unit Marketing Cost
Vegetables	2873	59(0.02)	4047	278.48(0.07)	372.00	250
Foodgrains	45	2(0.04)	75	9.44(0.13)	372.00	225
Gur	120	5(0.04)	165	23.60(0.14)	372.00	250
Fruits	55	2(0.04)	95	9.44(0.10)	372.00	150
Masala	18	4(0.04)	25	18.88(0.76)	372.00	245
All Agricultural Produce	3111	72(0.02)	4407	339.84(0.08)	372.00	300

Note : Figures in bracket show per unit marketing cost.

Source : Based on field data

Thus, it becomes evident that after the development of Gorabadshahpur market, the volume of trade would be increased and per unit cost of sale would also go up. But the increase in fee is not significant in view of increase in the volume of business.

As a result of improved facilities in Gorabadshahpur market, farmers/traders are expected to maintain the quality of their produce to be sold in the market. In other words, they will be able to bring their produce in this market in a more presentable manner. Buyers will also be satisfied while purchasing the commodities under improved market conditions. Hence, the sellers may justify at least 5 per cent increase in the prices of their produce. As there will be no real increase in per unit marketing cost, this hike in price would be a net gain to sellers of agricultural produce in Gorabadshahpur market as the estimate in following Table-15 shows.

Table-15 : Estimation of Net Gain in Marketing Under Market Improvement

Commodities	Estimated Total Value of Commodities sold per market at present (Rs.)	Estimated value of commodities to be sold per market day after market improvements (at current prices) (Rs.)	Estimated value of commodities to be sold after market improvement at 5% higher prices	Net gain per market day (Rs.)	Net gain per annum (Approx.) (Rs.)
Vegetables	24347.50	36181.22	37990.30	1809.06	188142.24
Foodgrains	843.75	1968.75	2067.19	98.44	10237.76
Gur	3240.00	5049.00	5301.45	252.45	26254.80
Fruits	1512.50	3657.50	3840.37	182.87	19018.48
Masala	4050.00	6000.00	6300.00	300.00	31200.00
All Agricultural produce	33993.75	52856.47	55499.30	2642.82	274853.28

Source : Based on field data

XVII. FINANCIAL ANALYSIS OF PROPOSED INVESTMENT IN GORABADSHAHPUR MARKET

Here we evaluate financial viability for providing facilities for the improvement of infrastructural facilities and other amenities in the rural market of Gorabadshahpur. Parameters involved in the financial analysis are detailed below:

1. Initial Capital Investment

Since the Gorabadshahpur market, at present, lacks infrastructural facilities therefore substantial amount will have to be spent on the modernisation of the market. Platform/sheds need to be constructed, water supply is to be arranged and other infrastructural facilities are to be provided. All this would require capital expenditure. According to our estimate, Rs.10.50,000/- would be needed as initial capital, which will have to be spent over a time span of one year. This may be termed as initial capital investment. We also assume that the entire capital investment will be made instantaneously at the beginning of the year. This is not an unrealistic assumption.

2. Life Span of the Project

The market infrastructural facilities proposed to be provided in the Gorabadshahpur market would have usefulness for a fairly long period of time though depreciation is bound to take place with the passage of time. The actual life span of the project cannot be estimated with high degree of accuracy but on the basis of technical opinion of the Architect/Civil Engineer, it is assumed that the facilities proposed to be

provided would last for a period of at least 15 years. It may not be unrealistic to assume that the facilities provided would remain useful even for a period of 20 years and above. In case of Gorabadshahpur market we have taken the life span of the project to be 15 years. Thus, scrap value of the initial infrastructural facilities created at a cost of Rs.10.50,000 has been treated as 30% of the initial capital cost, i.e. Rs.3,15,000.

3. Cost of the Capital

Cost of the capital for project is a critical factor which determines the viability of project. Cost of capital based on the competitive interest rates prevailing in the market would be too high if considered for this market. For socially desirable activities, it is even worthwhile to examine the financial viability at a relatively lower cost of capital. In practice also, the agencies involved in financing socially desirable activities encourage development of infrastructural facilities at a lower rate of capital cost. The projects so financed have plethora of social benefits, apart from financial benefits emanating from the project financed.

Keeping all this in view, 12 per cent annual cost of capital has been considered in the financial analysis of the Gorabadshahpur Market.

4. Cost of Repair and Maintenance

The proposed facilities to be provided in the market are bound to depreciate over the passage of time. Proper maintenance and upkeep of facilities in good condition is a social as well as economic necessity.

Keeping this objective in view, adequate provision has been made to account for the cost likely to arise on account of repair and maintenance. Items of expenditure under this head are as follows:

- (d) Expenditure on labour, materials and overheads for repair and maintenance of facilities;
- (e) Repair/Replacement of water pumps, electrical equipments and accessories etc. from time to time;
- (f) Salaries and wages payable to persons employed for the upkeep of facilities created by the project.

Details of annual maintenance expenditure are as follows:

1.	Watchman for Security @ Rs.1500 per month	Rs.18,000
2.	Sweeper for cleaning for 104 days @ Rs.40 per day	Rs. 4,160
3.	Electrical Maintenance for 104 days @ Rs.100 per day	Rs.10,400
4.	Maintenance of Handpump	Rs. 1,000
<hr/>		
Total		Rs.33,560
<hr/>		

The above expenditure is expected to increase @ 5% annually.

Technical estimates suggest that there would be zero expenditure on repair and maintenance of the project during the first year. It is assumed that during second and third years, 2 per cent of the initial investment would be required for repair and maintenance. During the years 4 to 7, this will be 3% of the initial investment and thereafter @ 5 per cent of the initial capital investment will be needed for repair and maintenance of civil work and other infrastructural facilities till 15th year.

5. Revenues Arising from the Market

The completion of the market improvement programme would result into substantial improvement in the working conditions of the Gorabadshahpur market. Farmers and traders would get a sizeable and respectable place to sit in and transact the business. They would be saved from the inconvenience arising due to limited space, open sale and bad weather. There is always a good-will value associated with a good looking shop.

As a result of improved facilities in the market, it is expected that on account of availability of improved facilities the users of market would be willing to pay an increased market fee and rent for using these facilities.

Views of farmers/traders were solicited on the required increase in the market fee recoverable from them after market improvement programme is carried out. Incremental increase in revenue due to creation of infrastructural facilities has been put at Rs.10,50,000 in the initial year. This is expected to go up @ 10% per annum.

NPV (Net Present Value) of Investments in the Projects

Based on the assumptions stated above, the sources of cash inflows and outflows are as follows:

Inflows

- a. Expected increase in revenue (Beginning at Rs.1,47,200 per annum and going up @ 10% per annum)
- b. Terminal value of initial investment (after 15 years from now) (30% of initial capital cost)

Outflows

- c. Initial capital cost (Rs.10,50,000)
- d. Cost of Repair and Maintenance (Rs.33560 in the initial year and expected to increase @ 5% per annum)
- e. Cost of maintenance of civil work and other infrastructural facilities (2% of capital cost in years 2 and 3, 3% in years 4 to 7, and 5% from years 8 onwards).

**Table 16: Computation of NPV and IRR on the basis of Expected Cash Flows
(Financial Point of View)**

Year	Addl Revenue Generated (based on increase @ 10% p.a.)	Terminal Value	Initial Capital Cost	Cost of Repair & Maintenance (based on increase @ 5% p.a.)	Rate of increase in the Maintenance cost of civil work	Cost of Maintenance of Civil Work (based @ 2% of initial investment in years 2&3 and 5% thereafter)	Net Cash Flow
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
0			1050000				(1050000)
1							0
2	147200			33560	0.02	21000	92640
3	161920			35238	0.02	21000	105682
4	178112			37000	0.03	31500	109612
5	195923			38850	0.03	31500	125573
6	215516			40792	0.03	31500	143223
7	237067			42832	0.03	31500	162735
8	260774			44974	0.05	52500	163300
9	286851			47222	0.05	52500	187129
10	315536			49583	0.05	52500	213453
11	347090			52063	0.05	52500	242527
12	381799			54666	0.05	52500	274633
13	419979			57399	0.05	52500	310080
14	461977			60269	0.05	52500	349208
15	508174	315000		63282	0.05	52500	707392
NPV = 291; IRR = 12% per annum							

Based on a cost of capita of 12%, the NPV of the project is Rs.291. However, with changes in the cost of capital, the NPV of the project is as follows:

Table 17: Impact of Changes in Cost of Capital on Net Present Value

Cost of Capital	NPV (in Rs.)
0.06	702691
0.08	414248
0.10	184623
0.12	291
0.14	(148893)
0.15	(212779)
0.16	(270597)

Additional revenue arising due to the proposed investment on infrastructural facilities is expected to be Rs.1,45,000 per annum in the initial year. However, if this falls short of the expectations, NPV becomes negative. In the tables below, the NPV and IRR are given for different amounts of additional revenue generated in the initial year ranging from Rs.145000 to as high as Rs.190000 along with the rates of growth in the revenues ranging from 5% per annum to 20% per annum.

Table 18 : Table Giving NPV at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)					
	145000	150000	160000	170000	180000	190000
0.05	(364652)	(326714)	(250839)	(174963)	(99087)	(23211)
0.06	(305339)	(265356)	(185390)	(105423)	(25457)	54509
0.08	(173472)	(128942)	(39881)	49180	138240	227301
0.10	(21606)	28161	127695	227229	326763	426297
0.12	153451	209255	320862	432469	544076	655693
0.14	355390	418157	543691	669225	794759	920293
0.15	467746	534387	667670	800952	934235	1067517
0.20	1168373	1259174	1440775	1622377	1803979	1985581

Table 19 : Table Giving IRR at Various Levels of Revenues of the Initial Year and Various Rates of Growth

		Revenue of the Initial Year (in Rs.)					
		145000	150000	160000	170000	180000	190000
Rate of Growth in Revenues	0.05	0.065	0.071	0.083	0.095	0.106	0.117
	0.06	0.076	0.082	0.094	0.106	0.117	0.127
	0.08	0.097	0.103	0.115	0.126	0.137	0.147
	0.10	0.117	0.123	0.135	0.146	0.157	0.167
	0.12	0.137	0.143	0.154	0.165	0.176	0.186
	0.14	0.156	0.162	0.173	0.184	0.195	0.205
	0.15	0.166	0.172	0.183	0.194	0.204	0.214
	0.20	0.211	0.217	0.228	0.239	0.249	0.259

Accumulations in the Sinking Fund

Surpluses of revenues over expenditure can be used for further expansion of facilities in the market and for providing additional facilities to sellers and buyers. These funds can be invested in safe and profitable investment avenues with a view to get a lump sum amount of money which can be used for replacement of infrastructural facilities when they get decayed and outdated. The deposits in the fund are expected to be as follows, depending upon the rate of interest earned on investments:

Table 20: Table giving accumulated value of Deposits made in the Sinking Fund at Different Rates of Interest, as at the end of 15 years

Rate of Interest	Revenue of the Initial Year (Rs. in Lakh)					
	145000	150000	160000	170000	180000	190000
0.08	45.50	47.65	51.95	56.26	60.56	64.86
0.09	47.92	50.20	54.75	59.31	63.87	68.43
0.10	50.51	52.93	57.76	62.59	67.43	72.26
0.11	53.30	55.86	60.99	66.12	71.25	76.38
0.12	56.29	59.01	64.46	69.91	75.36	80.81
0.13	59.51	62.40	68.19	73.98	79.78	85.57
0.14	62.97	66.05	72.20	78.36	84.52	90.68
0.15	66.68	69.96	76.52	83.07	89.63	96.19

ECONOMIC ANALYSIS

The following intangible benefits of the investment are particularly noteworthy:

1. Increase in the value of transactions carried out in the market
2. Benefits for women
3. Technology dissemination and technology development
4. Reduction in spoilage
5. Dissemination of market intelligence
6. Encouragement in the trade of agricultural and horticultural produce

As is quite obvious, if we take into consideration the impact of the above mentioned intangible factors on the NPV or IRR of the project, then investment on infrastructure in a rural market becomes a highly profitable proposition. Detailed calculations incorporating various aspects of social cost benefit analysis have not been carried out.

We have considered in this study the financial dimensions of the project and have gathered information relating to financial viability. Ultimate success of the project would depend on how imaginatively the project is managed in all its aspects. In this regard, sound financial management is of great importance.

There are considerable moral and cultural benefits accruing from the investment. Such investment cannot be looked as an instrument merely for solving the problems of poverty and backwardness. The real contribution of the investment is in terms of enhancing the quality of life of the people in the region. The project would be advantageous from different view points.

Some such non-tangible benefits accruing from investment in the project are detailed below:

1. Markets are held under unhygienic conditions as at present. Food articles, vegetables are kept under exposed conditions and become carriers of diseases and ailments. The project would create healthy and hygienic conditions and thereby the physical well being of the people would be improved.

2. Market is a place of social interaction. It is a venue where people belonging to the region converge for a day or two in a week and buy articles of daily consumption. Improved condition in the market enables people to buy good quality products and thus the quality of life would be improved.
3. Political and social reform activities are conducted through these markets. Improved conditions in the market would attract more and more people to come to the market and derive benefits.
4. Improved conditions in the market could lead to increased business activities and increased arrival of articles of consumption. More business transactions would be carried out through the market and consequently more employment as well as income generation opportunities would be opened up.
5. Consciousness about new products and technology, etc. would be spread through the market. This would lead to improvement in the living standards of people. Companies can launch new products and processes suited for local consumption through these markets.
6. Climatic conditions reach extreme level during summer, winter and rainy seasons. Conditions become extremely bad particularly during the rainy season and the arrivals of articles is adversely affected. During summer also, when temperature level reaches high, it becomes very difficult both for the traders as well as the customers to visit the market. During winter season also, chilly winds prevent customers and traders to visit the market. Improved conditions would increase the number of days during which the markets are held.

7. When markets are not held regularly or when customers do not arrive in adequate numbers, agricultural produce particularly the perishable vegetables get spoiled or they have to be sold at low price resulting into loss for the producers as well as consumers. Poor and vulnerable sections of the society are particularly harmed on account of poor conditions in the market.
8. Improvement in the market would lead to increased economic activity in the region. It would lead to more efficient and effective utilization of the natural as well as man-power resources available in the region.
9. Cultural activities would be encouraged through improved working conditions. Social welfare and reform activities can also be carried out more easily by improving the conditions in the market.

In a nutshell, the conditions in the market indicate the level of development of civilization. The investment under consideration is a contribution towards civilizational development and thus carries within it several non-financial and non-economic benefits.

If these are taken into consideration, the true value of NPV and IRR is much higher than has been computed in the study. This is shown in the table below. Here we have added an amount equal to 10% of the incremental trading caused due to generation of infrastructural facilities in the market. Savings caused due to reduction in spoilage @ 2% of the additional trading have also been added.

Table 21 : Computation of NPV and IRR on the basis of Economic Analysis

Cash Flow on the basis of Financial Analysis	Benefits of Increase in Trading	Benefit due to Reduction in Spoilage	Total Cash Flow
92640	27485	5497	125622
105682	28860	5772	140314
109612	30303	6061	145975
125573	31818	6364	163755
143223	33409	6682	183313
162735	35079	7016	204830
163300	36833	7367	207500
187129	38675	7735	233538
213453	40608	8122	262183
242527	42639	8528	293694
274633	44771	8954	328358
310080	47009	9402	366491
349208	49360	9872	408439
707392	51828	10366	769585

NPV = 250548; IRR = 14.916%

WORDS OF CAUTION

Financial viability of the project depends primarily on :

- (9) Surplus of Revenue over expenses (Net Cash Flow); and
- (10) The cost of capital.

In the Table-22 given below, we have calculated the requirements of net cash flow based on different life spans of the project ranging between 15 to 40 years and on the basis of cost of capital ranging between 5% to 18% per annum for an initial investment of Rs.10,50,000 on the infrastructural facilities in the market. The results are quite revealing in the same that if the market fails to generate a minimum revenue as given in the table, the investment would not be financially viable proposition.

Table 22 : Table Giving Equivalent Annual Cost for Different Life Span of the Project at Different Costs of Capital

		Life of Project (n) (in Years)					
		15	20	25	30	35	40
Cost of Capital (k)	0.05	101159	84255	74500	68304	64125	61192
	0.06	108111	91544	82138	76261	72423	69785
	0.08	122671	106945	98363	93269	90093	88053
	0.10	138047	123333	115676	111383	108874	107372
	0.12	154165	140573	133875	130351	128432	127369
	0.15	179568	167750	162434	159915	158692	158090
	0.16	188325	177100	172213	169980	168937	168445
	0.18	206223	196161	192065	190328	189578	189252

APPENDIX

MATHEMATICAL APPROACH INVOLVED IN THE APPRAISAL OF INVESTMENT ON INFRASTRUCTURE IN A RURAL MARKET

Let the initial investment on the development of infrastructural and public utilities in a market be Rs. 1. It takes about one year to complete the construction of the facilities and these are available for use after a period of one year since construction commences. It is assumed that incremental expenditure on maintenance of the facilities is incurred all at the end of every year and commences from the end of 2 years since construction starts. This same logic holds for incremental revenues also. The gap between incremental revenues and incremental expenditures (i.e. surplus of revenues over expenditures) is assumed to be Rs.X in the beginning (i.e. at the end of 2 years since construction etc. starts) and this increases in real term, @ g per annum. Useful life span of the initial investment is taken to be 14 years with an assumed depreciation @ 5% per annum simple, so that the terminal value of the infrastructural facilities created in the first year would remain to be 30% of the initial investment 1. Cost of capital is assumed to be 'k' per annum.

Based on the above logic,

$$I = \frac{X}{(1+k)(g-k)} \left[\frac{1+g}{1+k}^{14} - 1 \right] \frac{(1+k)^{15}}{(1+k)^{15} - 0.30} X, \quad \text{and}$$

$$X = \frac{[(1+k)^{15} - 0.30] (1+k)(g-k)}{[(1+k)^{15} \left(\frac{(1+g)^{14}}{(1+k)^{14}} - 1 \right)]}$$

If k and g are assumed to be 12% and 10% respectively, the above expression becomes

$$I = 10.53 \cdot X \cdot (Bx), \text{ or equivalently}$$

$$X = 0.095 \cdot I \cdot (C \cdot I)$$

If cost of capital (k) ranges between 6% to 15% and the growth in surplus (g) ranges between 5% to 20%, the following matrix giving the values of the coefficients involved in the above expression $X = .095 \cdot I$ is generated.

Table 23: Table giving the values of 'C' in the expression $X = C \cdot I$, at different rates of cost of capital and rates of growth

		k = Cost of capital					
		0.0600	0.0800	0.1000	0.1200	0.1400	0.1500
g = rate of growth in surplus of revenues over expenditures	0.0500	0.0746	0.0900	0.1067	0.1246	0.1437	0.1538
	0.0600	NA	0.0849	0.1009	0.1182	0.1367	0.1465
	0.0800	0.0620	NA	0.0901	0.1061	0.1234	0.1326
	0.1000	0.0546	0.0668	NA	0.0950	0.1110	0.1195
	0.1200	0.0479	0.0589	0.0712	NA	0.0995	0.1074
	0.1400	0.0419	0.0518	0.0629	0.0753	NA	0.0962
	0.1500	0.0392	0.0486	0.0591	0.0709	0.0840	NA
	0.2000	0.0277	0.0348	0.0429	0.0520	0.0624	0.0680

(X = Surplus of revenue over expenditure required to be generated at the end of year 2, I = Initial capital outlay, C = Coefficient values computed on the basis of the assumptions stated in the model)

The above table acts as a ready reckoner to ascertain the amount of surplus of revenues over expenditures required to be generated on annual basis with a constant annual growth rate of 'g' and a given cost of capital 'k' in order to justify (on the grounds of financial viability) the initial investment of Rs.1 in a market. As an example, if initial capital outlay on a market is Rs.10 lakhs, then $.095 \times$ Rs.1000000 = Rs.95000 is the annual surplus of revenues over expenditures which is required to be generated at the end of the initial year (i.e. year 2) in which facilities are made available for use. This should grow annually @ 10% per annum ($g=10$) in order to make the project viable from financial point of view.

Reciprocals of the values given in the table 21 above, gives the values of B in the expression $I = BX$. Results are as follows:

Table 24: Table giving the values of 'B' in the expression $I = BX$ at different rates of cost of capital and rates of growth

g = rate of growth in surplus of revenues over expenditure	k = Cost of capital						
	0.06	0.08	0.10	0.12	0.14	0.15	
0.05	13.40	11.11	9.38	8.03	6.96	6.50	
0.06	NA	11.77	9.91	8.46	7.31	6.83	
0.08	16.13	NA	11.09	9.42	8.10	7.54	
0.10	18.32	14.98	NA	10.53	9.01	8.37	
0.12	20.88	16.97	14.05	NA	10.05	9.31	
0.14	23.85	19.29	15.89	13.28	NA	10.39	
0.15	25.52	20.58	16.91	14.10	11.91	NA	
0.20	36.04	28.73	23.32	19.21	16.03	14.71	

The above table acts as a ready reckoner to ascertain the maximum amount of capital investment, which should be made on the expectation of a given amount of surpluses of revenues over expenditures. As an example, if it is expected that a surplus of Rs.95000 can be generated in the initial year, then the investment will remain financially viable upto a maximum investment of $Rs.10.53 \times 95000 = Rs.10$ lakhs. An initial investment of an amount less than Rs.10 lakhs, which can generate a surplus of at least Rs.95000 in the initial year, is of course, a good investment proposition. The above result is true for a cost of capital 12% and the annual growth of surplus of revenues over expenditure @ 10% per annum. Other values given in the table are interpreted similarly.

**TEJI BAZAR
RURAL MARKET**

BLOCK SHAHGANJ

DISTRICT JAUNPUR

I. LOCATION OF THE TEJI BAZAR MARKET

Teji Bazar rural haat used to be a bi-weekly market held at Dilshadpur village on Wednesday and Sunday of each week. But now, for last few years it has become a daily market. The market is 29 kms. away from Jaunpur district headquarter. To reach the market initially one has to reach Badlapur Padao which is 2 kms. from Jaunpur city. From Badlapur Padao one has to travel 27 kms. on Buxa-Lohendra marg to reach village Dilshadpur. Market is located in the mid of the village. The village and market of Teji Bazar coming in Buxa block are located about 11 kms from the block office. The market is being held on the sides of the road, does not have any market infrastructural facilities. Dilshadpur Gram Panchayat, which claims its ownership over this rural market does not collect any fee from farmers/traders of this market.

Thus, the present location of Teji Bazar rural market does not permit any kind of improvement for better market infrastructural facilities. The detailed location of the existing market and alternative proposed site by the Gram Pradhan and other members of the panchayat have been indicated in the enclosed map. The hinterland of Tehji Bazar rural market is quite large which consists of followint thirty (30) villages:

Name of the Village	Distance from the Market (in kms.)
1. Sarai	4.00
2. Rasikapur	5.00
3. Mohuddinpur	3.00
4. Mitau	3.00
5. Salamatpur	1.00

6. Sankargarh	1.00
7. Khampur	1.00
8. Sahodarpur	1.00
9. Margoopur	1.00
10. Kandhi	2.00
11. Sarsara	3.00
12. Karchuli	3.00
13. Goura	1.00
14. Shekhpura	1.00
15. Donai	2.00
16. Chitauri	3.00
17. Bhutaha	2.00
18. Barchauli	1.00
19. Chaukhra	1.00
20. Sarauli	2.00
21. Droripur	3.00
22. Barjee	3.00
23. Rehraa	3.00
24. Bidauli	2.00
25. Pannikpura	2.00
26. Daudaha	2.00
27. Sarai Tirloki	3.00
28. Janaur	4.00
29. Sitapur	4.00
30. Bhatauli	4.00

II. STRUCTURE OF THE MARKET

The field visit to the market for data collection and in-depth discussion with Dilshadpur village Pradhan and other knowledgeable persons of this area revealed that the structure of Teji Bazar rural Haat consists of about 98 shops of farmers/traders in

any normal market day. Among the total shops of different commodities vegetables shops are largest (60), followed by the foodgrain shops (12), Miscellaneous small eatable shops (12), meat and fish (6), clay pots (4) and other shops belonging to cobblers and bangle traders etc. (14).

Out of total shops in the market 25.51 per cent are owned by females. Among the shops selling vegetables and fodgrains in the market of Teji Bazar only vegetables shops are found to be owned by 30 per cent females. None of the shops selling foodgrains belonging to female farmer/trader in this market. However, in case of shops pertaining to bangles, clay pots, and miscellaneous eatables shops the female ownership is found to be the 100per cent, 75 per cent and 17 per cent respectively. The commodity-wise total number of shops owned by males and females with their respective percentage share are shown in Table-1. The sample selection for the study constitutes around 33 per cent as shown in Table-1.1.

Table-1 : Structure of the Teji Bazar Market

COMMODITIES	TOTAL SHOPS			PERCENTAGE OF TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	42(70.00)	18(30.00)	60(100.0)	57.53	72.00	61.22
Foodgrains	12(100.0)	--	12(100.0)	16.44	--	12.24
Meat & Fish	6(100.0)	--	6(100.0)	8.22	--	6.12
Bangles	--	2(100.00)	2(100.0)	--	8.00	2.04
Small eatables	10(83.33)	2(16.67)	12(100.0)	13.70	8.00	12.24
Clay Pots	1(25.00)	3(75.00)	4(100.0)	1.37	12.00	4.08
Cobbler	2(100.00)	--	2(100.0)	2.74	--	2.04
Total	73(74.49)	25(25.51)	98(100.00)	100.00	100.00	100.0

Note : Figures in brackets indicate percentage.

Source: Based on field data.

Table-1.1 : Sample of the Market

COMMODITIES	SELECTED SAMPLE SHOPS			PERCENTAGE OF SAMPLE SHOPS IN TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	17(85.00)	3(15.00)	20(100.00)	40.48	16.67	33.33
Foodgrains	4(100.00)	--	4(100.00)	33.33	--	33.33
Total	21(87.50)	3(12.50)	24(100.00)	38.89	16.67	33.33

Note : Figures in brackets indicate percentage.

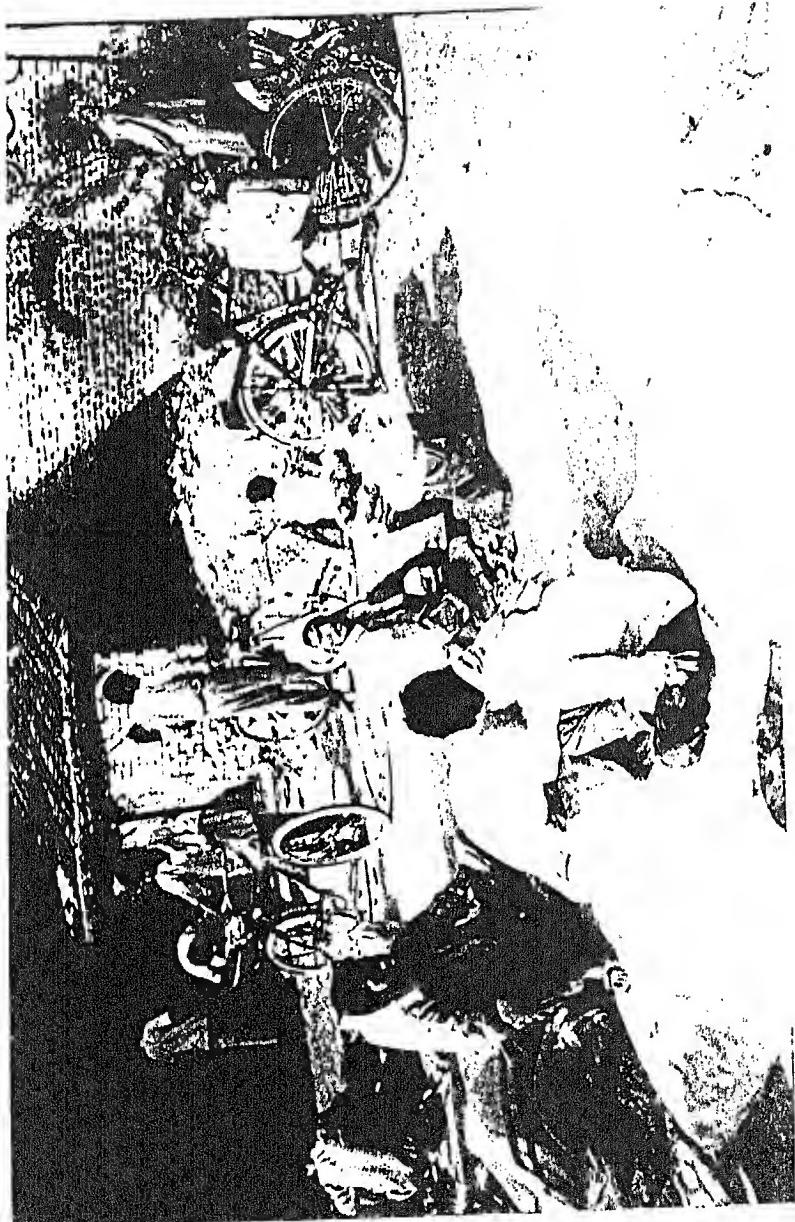
Source: Based on field data.

III. COMPOSITION OF THE MARKET

As shown in Table-2, the farmers and traders bring different commodities for sale in rural market of Teji Bazar. In each of the market days it is found that among all the sellers of goods and services, more than half of them are the farmers (53.06 per cent) and less than half (46.94 per cent) are the traders. In the category of vegetables shops, 70 per cent belonged to farmers and rest of 30 per cent are traders. But in case of foodgrains only 33.33 per cent shops belonged to the farmers coming from villages located in market hinterland and most of the 66.67 per cent foodgrain shops are owned by the local traders. In other groups of shops also 100 per cent shops belong to traders except in case of miscellaneous small eatable shops. In this case, about 17 per cent shops belong to farmers. The whole picture indicates that in case of vegetables, which is the main arrival of the market, are mostly sold by farmers. This phenomenon is indicative of the fact that Teji Bazar rural market has three distinctive features:

of Jamnpur

Forsgrain Shop At Tejga Bazaar Purnia Market-



1. Teji Bazar rural market is local agricultural based daily market.
2. This is primarily a market of vegetables, like tomato, cauliflowers and peas.
3. Majority of market activities are run by local farmers.

Table-2: Farmers and Traders Composition in the Teji Bazar Market

Commodities	Farmers	Traders	Total
Vegetables	42(70.00)	18(30.00)	60(100.00)
Foodgrains	4(33.33)	8(66.67)	12(100.00)
Meat & Fish	--	6(100.00)	6(100.00)
Bangles	--	2(100.00)	2(100.00)
Small eatable shops	2(16.67)	10(83.33)	12(100.00)
Clay Pots	4(100.00)	--	4(100.00)
Cobbler	--	2(100.00)	2(100.00)
Total	52(53.06)	46(46.94)	98(100.00)

Source : Based on field data.

IV. COMPOSITION OF THE SAMPLE

Considering the existing share of total farmers and traders in selling of different agricultural produce in Teji Bazar rural market, the sample covers 75 per cent farmers and 25 per cent traders in the sample of the study. In case of vegetables and foodgrains shops separately 85 per cent and 25 per cent shops belong to farmers and selected as sample respectively. In both the categories of shops selling agricultural produce, the

percentage of traders' shops in the sample varied from 15 per cent to 75 per cent in case of vegetables and foodgrains respectively as shown in Table-3.

Table-3: Farmers and Traders Composition in the Sample of Teji Bazar Market

Commodities	Farmers	Traders	Total
Vegetables	17(85.00)	3(15.00)	20 (100.00)
Foodgrains	1(25.00)	3(75.00)	4 (100.00)
Total	18(75.00)	6(25.00)	24 (100.00)

Source : Based on field data.

V. TURN OVER OF AGRICULTURAL PRODUCE IN TEJI BAZAR MARKET

The structure of Teji Bazar rural market indicates that this is primarily a market of agricultural commodities produced in the villages of market hinterland. The structure of Teji Bazar shows that out of the total 98 shops involved in the sale of different commodities the share of shops dealing in agricultural commodities (72) comes more than 73 per cent. The vegetables commanded major share followed by foodgrains. Data collected from the sample shops shows that on an average 41.35 kgs. of vegetables were sold by each vegetable shops followed by 36.25 kgs. of foodgrains per shop. On the basis of this, the total quantity sold by all shops per market day comes to 2481 kgs and 435 kgs in respect of vegetables and foodgrains as is evident from Table-

4. The total turnover of agricultural produce per market day turns out to be 2916 kgs. in Teji Bazar rural market of Jaunpur.

Table-4: Actual Turn Over of Agricultural Produce in Teji Bazar Market

Commodities	No. of Shops In the Sample	Total Qty. Sold per Market Day by Sample Shops (Kg.)	Average Qty. sold per sample shop per market day (Kg.)	No. of Total shops in the market	Total Qty. sold by all shops per market day (Kg.)
Vegetables	20	827	41.35	60	2481.00
Foodgrains	4	145	36.25	12	435.00
All Agricultural Produce	24	972	40.50	72	2916.00

Source : Based on field data.

One of the criterions of selection of rural haat/painths for feasibility study is that while selecting the market it should be ensured that either market turnover is more than 1000 MT per annum of all agricultural produces or market has the potential to attain this target in coming years. The first part of this precondition of market selection is justified in case of the Teji Bazar rural market because our estimates as shown in Table-5 based on primary data collected from sample farmers/traders selling their produce in this market indicated that this market has annual turnover of around 1064 MT of all agricultural produces. The annual turnover of vegetables has been estimated to be 905.57 MT followed by 158.77 MT of foodgrains as shown in Table-5.

BLOCK : BUXA
 DISTRICT : JAUNPUR

BADLAPUR

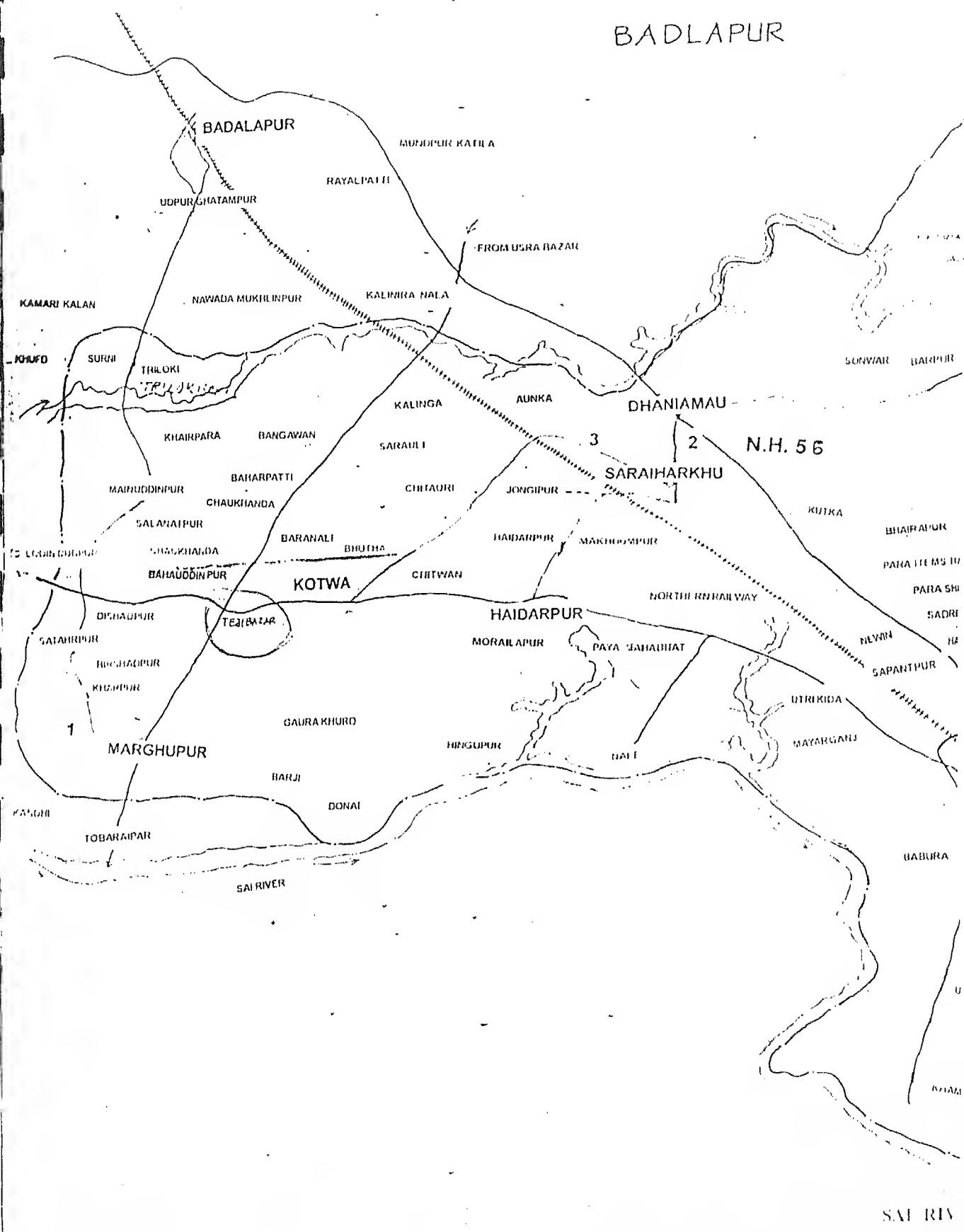


Table-5 : Annual Turn Over of All Agricultural Produce in the Teji Bazar Market

Commodities	Turn Over (MT)
Vegetables	905.57
Foodgrains	158.77
All Agricultural Produce	1064.34

Source : Based on field data.

VI. PERSONS INVOLVED IN BUYING AND SELLING

As per our observation and data collection, there are 98 shops of different commodities per market day in the Teji Bazar rural market. The average number of persons found to be engaged in selling is one in case of vegetables and foodgrains shops. But in case of other than these shops the average number of persons involved in sale turns out to be more than one as shown in Table-6. It is further revealed through Table-6 that on an average around 29 persons make purchases from each shop of the market in a single market day. In case of vegetables and foodgrains average involvement per shop for buying the produce is found to be 27 persons and 31 persons respectively. At the same time in case of non-agricultural commodities, the average number of purchasers from each shop ranges between 10 persons to 50 persons. In total, 2810 persons are estimated to be involved in buying of different commodities per

market day. Apart from this more than hundred (106) persons are found to be engaged in selling their produce in the market.

Table-6: Total and Average Number of Persons Involved in Selling and Buying Per Market Day in Teji Bazar Market

Commodities	No. of Persons Involved in Selling	Average No. of Persons Involved in Selling	Total No. of Persons Involved in Buying	Average No. of Persons Involved in Buying (No.)
Vegetables	60	1.00	1620	27.00
Foodgrains	12	1.00	375	31.25
Meat & Fish	8	1.33	90	15.00
Bangles	4	2.00	40	20.00
Small eatables shops	16	1.33	600	50.00
Clay Pots	4	1.33	40	10.00
Cobbler	2	1.00	45	22.50
Total	106	1.08	2810	28.67

Source : Based on field data.

VII. MARKET FEES, REVENUE OBTAINED AND ITS POTENTIAL

In course of detailed interview of the farmers/traders of Teji Bazar market, it is estimated that if an average of Re.1 per shop is collected as market fee (which may be considered to be minimum amount of market fee) per market day from Tej Bazar market by Dilshadpur Gram Panchayat, a sum of Rs.98 may be collected per market day. In

this way, a total average sum of Rs.35770 per annum may be collected. But as stated earlier, at present no market fee is being charged/collected by the Gram Panchayat from Teji Bazar rural market (Table-7).

Table-7 : Present Potential of Market Fee in Teji Bazar Market

Commodities	Total Shops	Potential Market Fees per Market Day (Rs.)	Potential Market Fee Per Annum (Rs.)
Vegetables	60	60	21900
Foodgrains	12	12	4380
Meat and Fish	6	6	2190
Bangles	2	2	730
Small Eatables	12	12	4380
Clay Pots	4	4	1460
Cobbler	2	2	730
Total	98	98	35770

Source : Based on field data.

VIII. MODE OF TRANSPORT USED

For bringing the agricultural produce for sale in the Teji Bazar rural market the farmers/traders are found to be using cycle and rickshaw trolley as mode of transport. Apart from these, about 21 per cent farmers/traders have reported to be coming on foot in this market. To bring the vegetables in the market, 50 per cent farmers and traders

used cycle and rest of the 25 per cent have brought their vegetables on foot as per our field data collected from the market of Teji Bazar. Some 28 per cent farmers/traders have brought vegetables on rickshaw trolley. In case of foodgrains 25 per cent farmers/traders used trolley and 75 per cent have brought their foodgrain on cycle in the market of Teji Bazar. Thus, the most convenient and popular mode of transport for farmers/traders turns out to be cycle in case of Teji Bazar market as shown in Table-8.

Table-8: Traders Using Different Mode of Transport to Bring Agricultural Commodities

Commodities	Cycle	On Foot	Rickshaw/ Trolleys	(No.)
Vegetables	10(50.00)	5(25.00)	5(25.00)	20 (100.0)
Foodgrains	3(75.00)	--	1(25.00)	4 (100.00)
Total	13(54.17)	5(20.83)	6(25.00)	24 (100.00)

Note : Figures given in brackets are percentage.

Source : Based on field data.

IX. DISTANCE COVERED TO REACH THE MARKET

The rural market of Teji Bazar is an important daily market of Buxa Block. Its hinterland extends to around 30 villages. But these villages are not scattered too far from Teji Bazar. As many as 37.50 per cent farmers/traders coming in this market cover a distance limited to 2 kms. only. Some 16.67 per cent cover a distance ranging 2 to 3 kms. to reach this market. Remaining about 46 per cent farmers/traders cover a

distance of 3 to 5 kms. to bring their produce for sale in the market of Teji Bazar. The fartherest distance of 3 to 5 kms. is covered by 40 per cent of farmers/traders bring their vegetables in the market. Where as 75 per cent farmers/traders involved in the sale of foodgrains cover the same distance to reach this market. Thus, the average distance covered by vegetable shop owners in this market is lesser (2.85 kms.) than the average distance to be covered by shop owners of foodgrains (3.87 kms.) in the market of Teji Bazar.

All these characteristics point to the fact that the Teji Bazar is an important trading centre of vegetables and foodgrains for the people residing in a sizeable area located at a comfortable distance. Hence, its improvement is going to benefit large number of villages. In Table-9, classification of sample traders/farmers has been made according to the commodities sold by them and distance covered.

Table-9 : Classification of Sample Farmers/Traders According to the Distance Covered to reach the Teji Bazar Market

Commodities	No. of Traders/Farmers				Average Distance Covered (Km.)
	0-2 (km.)*	2-3 (kms.)	3-5 (kms.)	Total	
Vegetables	9(45.00)	3(15.00)	8(40.00)	20(100.0)	2.85
Foodgrains	--	1(25.00)	3 (75.00)	4 (100.00)	3.87
Total	9(37.50)	4(16.67)	11(45.83)	24 (100.00)	3.02

Note : Figures in brackets indicate percentage.

Source: Based on field data.

X. NEED OF IMPROVED FACILITIES

It is evident from informations of Teji Bazar rural market available so far that there is an immense scope and need for making available marketing infrastructural facilities. Therefore, almost need is to provide improved facilities because all the sample farmers and traders have expressed their desire to have such facilities as shown in Table-10. It becomes obvious that farmers/traders selling different commodities in the market need improved facilities and all of them are willing to pay higher market fee for using the improved marketing infrastructural facilities.

Table-10 : Need of Improved Marketing Facilities in Teji Bazar Market

Commodities	Total No. of Farmers Shops	No. of Farmers Shops requiring improved facilities	No. of farmers willing to pay higher market fee	Total No. of Traders shops	No. of traders shops requiring improved facilities	No. of traders willing to pay higher market fee
Vegetables	17	17(100.00)	17(100.00)	3	3(100.00)	3(100.00)
Foodgrains	1	1(100.00)	1(100.00)	3	3(100.00)	3 (100.00)
Total	18	18(100.00)	18(100.00)	6	6(100.00)	6(100.00)

Note : Figures in brackets indicate percentage.

Source : Based on field data.

XI. TYPE OF MARKETING FACILITIES REQUIRED

As it is observed that infrastructural facilities are largely lacking in the market of Teji Bazar, the farmers/traders who bring different agricultural produce for sale in the market were asked using PRA method by research team members regarding types of

infrastructural facilities required by them. The farmers/traders who responded to them are presented in Table-11. It is evident from the information presented in Table that most of the farmers/traders are in need of facilities like – road, shed, permanent shops, platform and proper drainage facilities. The electricity, toilet, proper place for sitting and cycle stand are some other important facilities required by a sizeable number of existing farmers/traders dealing in the market of Teji Bazar. Some 57 to 67 per cent sellers are also found to be in need of storage facilities for the security and smoother sale in the market of Teji Bazar. Giving their view on the type of infrastructural facilities required, all female sellers coming to this market have expressed their requirement for proper drainage, toilets, drinking water, road and electricity. The second important group of facilities for them is found to be proper place for sitting, permanent shops and tin sheds. These facilities are required by majority of female sellers of different commodities coming to this market. Some other facilities like platform and storage are also needed by female farmers and traders of this market.

Table-11 : Type of Marketing Infrastructural Facilities Required by the Farmers/Traders of Teji Bazar Market

Commodities	Total No. of Farmers/traders	Place	Dri-king Water	Shed	Road	Plat-form	Electri-city	Stor-age	Toilet	Perm-ent shop	Cycle stand	Proper drain-age
Vegetables	20	10 (50.00)	20 (100.0)	19 (95.00)	20 (100.0)	14 (70.00)	20 (100.0)	12 (60.00)	15 (75.00)	16 (80.00)	17 *85.00	16 (80.00)
Male	17	7 (41.18)	7 (100.0)	17 (100.0)	7 (100.0)	12 (70.59)	7 (100.0)	10 (58.82)	12 (70.59)	13 (76.47)	17 (100.0)	14 (82.35)
Female	03	3 (100.0)	3 (100.0)	2 (66.67)	3 (100.0)	2 (66.67)	3 (100.0)	2 (66.67)	2 (66.67)	3 (100.0)	-- --	2 (66.67)
Foodgrainsr	4	3 (75.00)	4 (100.0)	2 (50.00)	4 (100.0)	3 (75.00)	4 (100.0)	2 (50.00)	1 (25.00)	3 (75.00)	4 (100.0)	2 (50.00)
Male	4	3 (76.00)	4 (100.0)	2 (50.00)	4 (100.0)	3 (75.00)	4 (100.0)	2 (50.00)	1 (25.00)	3 (75.00)	4 (100.0)	2 (50.00)
Female	--	--	--	--	--	--	--	--	--	--	--	--
Total	24	13 (51.17)	24 (100.0)	21 (87.50)	24 (100.0)	17 (70.83)	24 (100.0)	14 (58.33)	18 (66.67)	19 (79.17)	21 (87.50)	18 (75.00)
Male	21	10 (47.62)	31 (100.0)	19 (90.48)	31 (100.0)	15 (71.43)	31 (100.0)	12 (57.14)	13 (61.90)	16 (76.19)	21 (100.0)	16 (76.19)
Female	3	3 (100.0)	3 (100.0)	2 (66.67)	3 (100.0)	2 (66.67)	3 (100.0)	2 (66.67)	3 (100.0)	3 (100.0)	-- --	2 (66.67)

Note : Figures in brackets indicate percentage.

Source : Based on field data.

XII. EXPECTED INCREASE IN ARRIVALS AFTER MARKET IMPROVEMENT

It is evident from preceding analysis that in the rural market of Teji Bazar (i) market infrastructural facilities are mostly absent, and (ii) the farmers/traders of the market want improved facilities by paying required market fee. In view of this, it has been tried to estimate as to how much increase in turnover of different agricultural commodities would result on account of provision of improved infrastructural facilities. This analysis has been carried out and presented in Table-12. It is shown in Table-12 that the arrivals of vegetables are expected to grow by 167 per cent and foodgrains by 200 per cent. In total, the arrivals of all agricultural commodities are expected to experience a growth of around 172 per cent per market day if improved market infrastructural facilities are made available in this market. The total increase in arrivals of all agricultural produce is expected to result on account of increase in present arrivals and increase in number of new shops of around fifty two (52).

Table-12: Expected Increase in Arrivals of Agricultural Produce After Market Improvement in the Teji Bazar Market

Commodities	Vegetables	Food-grains	All Agricultural Produce
Number of Sample Shops	20	4	24
Total Qty. expected to be sold by sample shops per market day (Kg.)	1262	275	1537
Average Qty. expected to be sold by sample shops per market day (kg.)	63.10	68.75	64.04
Total No. of Shops in the market	60	12	72
Total Qty. Expected to be sold per market day in existing shops (kg.)	3786	825	4611
Expected increase in number of new Shops	45	7	52
Expected turnover of new entrants (Kg.)	2839.50	481.25	3330.08
Total expected increase in turnover per market day (kg.)	6625.50	1306.25	7941.08
Actual Qty. sold per market day (kg.)	2481.00	435.00	2916.00
Percentage Increase	167.05	200.29	172.33

Source : Based on field data.

XVI. ECONOMIC BENEFITS EMANATING FROM IMPROVEMENTS IN THE INFRASTRUCTURE OF RURAL HAAT/PAINTHS

There are many objectives for making improvement in the existing rural haat/painths in Uttar Pradesh. We have already discussed those at proper place. But apart from those there are other economic benefits which are likely to accrue in the process of market improvements. These benefits become important factor in justifying the initiative of market improvement programme in a rural market. The economic benefits may broadly grouped under following categories:

1. As a result of increased volume of trade due to market improvement, the percentage increase in per unit cost of sale turns out to be far lower as compared to percentage increase in market fee collection.
 2. Improved efficiency of market operations in the form of better product display, better facilities and availability of more marketing hours for the buyers and sellers resulting in high per unit price of agricultural produce. Hence, providing remunerative prices to the farmers/traders.
 3. Reduction in spoilage of perishable crops; vegetables and fruits with the availability of improved rural marketing infrastructure.
- I. Since it is very logical to propose before farmer/trader having shops in the market for bearing higher market fee because of availing better market infrastructrure. The shops owners in the rural market of Teji Bazar have convincingly agreed to pay higher market fee for availing improved market infrastructural facilities. Besides, some (52) new shops are expected to generate additional market fee by joining the Teji Bazar market for availing improved infrastructural facilities in Teji Bazar market.

Table-13 presents the detailed picture of required increase in market fee collection for different marketed produce owing to expected market improvements. As per Table, per market average fee collection at the rate of Re.1 per shop from all existing shops comes to Rs.98, which is required to be Rs.394.00 for market improvements. It is our estimate that around 52 new shops will be joining the existing 98 shops and this will generate required amount of Rs.394.00 as market fee per market day to meet the cost of capital for creating required marketing infrastructural facilities in Teji Bazar rural market. If this is to be calculated on an annual basis, the required increased total revenue, i.e. 394.00 can be multiplied by 365 days of a year on which market will be held. It comes to around Rs.143760, which is required revenue generation for this market.

Table-13 : Potential Market Fee Paid and Increased Market Fee Expected to be paid by Traders/Farmers of Teji Bazar Market

Commodities	No. of Total Shops at Present	Present Potential of Market Fee (Per Market Day) (Rs.)	Expected Total No. of Shops after Market Improvement (No.)	Total increased market fee required for market improvement (Per Market Day) (Rs.)	Percentage Increase in Market Fee After Market Improvements
Vegetables	60	60	105	275.85	271.00
Foodgrains	12	12	19	49.90	235.67
Meat & Fish	6	6	6	15.75	112.00
Bangles	2	2	2	5.25	112.00
Small eatables	12	12	12	31.50	112.00
Clay Pots	4	4	4	10.50	112.00
Cobbler	2	2	2	5.25	112.00
Total	98	98	150	394.00	224.49

Source : Based on field data.

Despite increased market fee collection, in real terms, per unit cost of improved marketing facilities in case of all produces sold in the market remain same or marginally

high. Table-14 indicates that there has been an increase of 162.67 per cent in total market fee collection as a result of market improvement. As compared to this estimates have shown that increase in per unit cost of marketing would remain only 100 per cent after market improvements. Significance increase in per unit cost of marketing has been observed only in case of vegetables. In case of foodgrains there has been only 33 per cent increase in per unit cost of marketing. Whatever marginal increase in per unit cost of marketing (in case of vegetables) is visible in our estimates, it is not expected to remain same in coming years due to fast improvement in volume of trade in existing shops and entry of new sellers in the market. Thus, provision of improved market facilities without significant increase in marketing cost from the very beginning in Teji Bazar may be considered to be a significant economic benefit.

Table-14 : Change in Marketing Cost Before and After Market Improvement

Commodities	Present Market Turn Over of Sample Shops (Per Market Day) (Kg.)	Total Market Fee Collected Presently from Sample Shops (Per Market Day) (Rs.)	Expected Market Turn-over after market improvement in sample shops (Kg.)	Total Required Collection as Market Fee from Sample Shops (Rs.)	Percentage Increase in Fee Collection after Market Improvement (Rs.)	% Increase in Per Unit Marketing Cost (Rs.)
Vegetables	827	20(0.02)	1262	52.54(0.04)	162.70	100.00
Foodgrains	145	4(0.03)	275	10.50(0.04)	162.50	33.33
All Agricultural Produce	972	24(0.02)	1537	63.04(0.04)	162.67	100.00

Note : Figures in bracket show per unit marketing cost.

Source : Based on field data.

II. With the availability of improved marketing facilities and infrastructure in the daily market of Tej Bazar farmers/traders are expected to maintain the quality of their products to be sold in the market. In other words, they will be able to bring their produce in the market in a more presentable manner. Buyers will also feel more comfortable and confident while purchasing the agricultural produce under improved marketing conditions. Under these improved market conditions sellers of produce may very easily justify atleast 5 per cent increase in the prices of their produce. As there would be either very low or no real increase in per unit cost of marketing of agricultural produce, the hike in prices would be a net gain to the farmers/traders selling their produce in the market of Teji Bazar.

Table-15 exemplifies the net gain coming out of 5 per cent increase in average prices of agricultural and other produce on account of improved market efficiency in a rural market of Teji Bazar.. These estimates are based on quantity and prices of vegetables and foodgrains recorded from sample shop owners in Teji Bazar rural market of Buxa block of district Jaunpur. However, the estiamtes are approximate because the factor of seasonality has not been taken into consideration. It is evident from figures that under this process the highest gainers are of farmers/traders are dealing on vegetables followed by others selling foodgrains in Tej Bazar market. Data presented in Table-15 show that the farmers/traders involved in the trading may gain a sum of Rs.481080.95 per annum with the introduction of market improvements in Teji Bazar market.

Table-15 : Estimation of Net Gain in Marketing Under Market Improvement

Commodities	Estimated Total Value of Commodities sold per market at present (Rs.)	Estimated value of commodities to be sold per market day after market improvements (at current prices) (Rs.)	Estimated value of commodities to be sold after market improvement at 5% higher prices	Net gain per market day	Net gain per annum (Approx.) (Rs.)
Vegetables	6202.50	16563.75	17391.94	828.19	302289.35
Foodgrains	3262.50	9796.87	10286.71	489.84	178791.60
All Agricultural produce	9465.00	26360.62	27678.65	1318.03	481080.95

Source : Based on field data

Other indirect economic benefits are also involved in the process of efficient marketing system. A transparent and efficient system, as suggested for Teji Bazar market, will reduce the interference of middlemen and brokers in the determination of agriculture and other produce prices in the market. This will result in direct benefit to farmers/traders on account of increased prices. This gain may lead to expansion of agricultural activities resulting in higher production in the catchment area of Teji Bazar market.

III. Erection of marketing infrastructural facilities in Teji Bazar market may provide special benefit in the trading of perishable produce like vegetables, fruits and meat. In

case of vegetables, fruits and meats, availability of facilities like water shed, light and storage may reduce at least 20 per cent spoilage of arrivals in the Teji Bazar market.

Total market turn over is expected to go higher with the availability of above listed infrastructural facilities. In case of fruits the spoilage rate is found to be over 40 per cent during the peak season in Teji Bazar market.

With the availability of water shed and storage the spoilage rate under such conditions may go down to less than 20 per cent. In case of meat and fish marketing, the availability of better infrastructural facilities will reduce the spoilage of these produce to a considerable extent. Apart from this the hygienic conditions will also be maintained with the availability of these facilities in the market. Under the ordinary conditions the spoilage of fruits and meat products is 25 to 35 per cent and it could be reduced to 15 to 10 per cent with the availability of required infrastructural facilities in Tej Bazar market of Buxa block.

XVI. FINANCIAL AND ECONOMIC APPRAISAL OF INVESTMENT IN RURAL MARKET OF TEJI BAZAR

Introduction

Rural markets are a hub-centre of socio-economic activities in a region. Along with public services such as Primary Health Centre, Veterinary Hospital, Post Office, Bank, Educational Institutions, Play Ground, PCO, Police Station, etc., they provide a fillip to the tempo of social, cultural and economic growth of the region comprising of a

number of villages from where buyers and sellers of goods and services are attracted to these markets.

Existing conditions in some such markets are far from satisfactory. A typical market may consist of stalls of a temporary nature and sellers sit on ground and on chabutras of houses and shops, open to sky without any shed or cover. Quite often they are held once, twice or thrice a week during the afternoon hours. Some may be the daily markets also.

The products traded in such markets include vegetables, fruits, edible oil, spices, jaggery, foodgrains, meat, fish, ready made wears, chappals, sweets, chhats, general goods and services of cobblers, smiths, barbers, etc. Arrival of commodities in the market fluctuates, depending upon the season and other factors.

Catchment area of such rural markets comprises of a large number of smaller and big villages in the vicinity of the village where the market is held. Total catchment area of such markets may cover a distance of some 6-8 kms. comprising of 10-15 villages or even more.

The following are some of the important infrastructure and public utilities usually required in such markets:

1. Pucca open platforms
2. Shaded platforms
3. Pucca Shops
4. Space for Market Information Centre and Office for Market Management Committee
5. Room for Security Guard

6. Place for parking of cycles, scooters, buggies, horse-carts, tractor-trolleys, etc.
7. Storage facility
8. Electrification
9. Drainage facility
10. Boundary wall and Fencing around the haat area with the gates
11. Construction of Roads
12. Cattle Shed with drinking water facilities
13. Drinking water
14. Toilets
15. Place for waste disposal
16. Plantation of trees

Management of the Market

Quite often the rural market is managed by the Gram Panchayat which realizes 'Tehbazari' from the traders. Another alternative arrangement is that the contract is awarded to a contractor for a stipulated amount per period and the contractor collects Tehbazari from the shopkeepers at predetermined rates. Gram Panchayat may form a "Market Management Committee" (MMC) to monitor the various activities of the market. The committee may take decisions on the mode of maintenance, management, rate of Tehbazari, method of its realization and settlement of disputes related to the market.

Construction of a market with covered and open pucca platforms, fencing around the area and facilities for storage, toilets, water supply, proper drainage and parking, etc.

can bring about an improvement in the conditions in such rural markets. Shopkeepers are willing to pay the 'Tehbazari' at higher rates provided proper facilities are developed.

Financial Analysis of Investment in Infrastructure

Initial investment is required on land and on capital cost involved in the creation of infrastructural facilities described above. Land for rural market could be the land owned by the Gram Panchayat, so that no investment is required to be made on this count.

Upkeep of the infrastructure is a must for the sustainability and trouble-free services. Below we provide estimates of expenditure (both capital and revenue type) required to be made in Teji Bazar market located in Buxa Block of Jaunpur District, for which this feasibility study is being carried out (For details of the mathematical approach involved in this, see the Appendix given at the end).

XVII. FINANCIAL ANALYSIS OF PROPOSED INVESTMENT IN TEJI BAZAR MARKET

Here we evaluate financial viability for providing facilities for the improvement of infrastructural facilities and other amenities in the rural market of Teji Bazar. Parameters involved in the financial analysis are detailed below:

1. Initial Capital Investment

Since the Teji Bazar market, at present, lacks infrastructural facilities therefore substantial amount will have to be spent on the modernisation of the market.

Platform/sheds need to be constructed, water supply is to be arranged and other infrastructural facilities are to be provided. All this would require capital expenditure. According to our estimate, Rs.7,80,000/- would be needed as initial capital, which will have to be spent over a time span of one year. This may be termed as initial capital investment. We also assume that the entire capital investment will be made instantaneously at the beginning of the year. This is not an unrealistic assumption.

2. Life Span of the Project

The market infrastructural facilities proposed to be provided in the Teji Bazar market would have usefulness for a fairly long period of time though depreciation is bound to take place with the passage of time. The actual life span of the project cannot be estimated with high degree of accuracy but on the basis of technical opinion of the Architect/Civil Engineer, it is assumed that the facilities proposed to be provided would last for a period of at least 15 years. It may not be unrealistic to assume that the facilities provided would remain useful even for a period of 20 years and above. In case of Teji Bazar market we have taken the life span of the project to be 15 years. Thus, scrap value of the initial infrastructural facilities created at a cost of Rs.7,80,000 has been treated as 30% of the initial capital cost, i.e. Rs.2,34,000.

3. Cost of the Capital

Cost of the capital for project is a critical factor which determines the viability of project. Cost of capital based on the competitive interest rates prevailing in the market would be too high if considered for this market. For socially desirable activities, it is even

worthwhile to examine the financial viability at a relatively lower cost of capital. In practice also, the agencies involved in financing socially desirable activities encourage development of infrastructural facilities at a lower rate of capital cost. The projects so financed have plethora of social benefits, apart from financial benefits emanating from the project financed.

Keeping all this in view, 12 per cent annual cost of capital has been considered in the financial analysis of the Teji Bazar Market.

4. Cost of Repair and Maintenance

The proposed facilities to be provided in the market are bound to depreciate over the passage of time. Proper maintenance and upkeep of facilities in good condition is a social as well as economic necessity.

Keeping this objective in view, adequate provision has been made to account for the cost likely to arise on account of repair and maintenance. Items of expenditure under this head are as follows:

- a. Expenditure on labour, materials and overheads for repair and maintenance of facilities;
- b. Repair/Replacement of water pumps, electrical equipments and accessories etc. from time to time;
- c. Salaries and wages payable to persons employed for the upkeep of facilities created by the project.

Details of annual maintenance expenditure are as follows:

1.	Watchman for Security @ Rs.1500 per month	Rs.18,000
2.	Sweeper for cleaning for 365 days @ Rs.40 per day	Rs.14,600
3.	Electrical Maintenance for 365 days @ Rs.100 per day	Rs.36,500
4.	Maintenance of Handpump	Rs. 1,000
<hr/>		
	Total	Rs.70,100
<hr/>		

The above expenditure is expected to increase @ 5% annually.

Technical estimates suggest that there would be zero expenditure on repair and maintenance of the project during the first year. It is assumed that during second and third years, 2 per cent of the initial investment would be required for repair and maintenance. During the years 4 to 7, this will be 3% of the initial investment and thereafter @ 5 per cent of the initial capital investment will be needed for repair and maintenance of civil work and other infrastructural facilities till 15th year.

5. Revenues Arising from the Market

The completion of the market improvement programme would result into substantial improvement in the working conditions of the Teji Bazar market. Farmers and traders would get a sizeable and respectable place to sit in and transact the business. They would be saved from the inconvenience arising due to limited space, open sale and bad weather. There is always a good-will value associated with a good looking shop.

As a result of improved facilities in the market, it is expected that on account of availability of improved facilities the users of market would be willing to pay an increased market fee and rent for using these facilities.

Views of farmers/traders were solicited on the required increase in the market fee recoverable from them after market improvement programme is carried out. Incremental increase in revenue due to creation of infrastructural facilities has been put at Rs.1,43,760 in the initial year. This is expected to go up @ 10% per annum.

NPV (Net Present Value) of Investments in the Projects

Based on the assumptions stated above, the sources of cash inflows and outflows are as follows:

Inflows

- a) Expected Increase In revenue (Beginning at Rs.1,43,760 per annum and going up @ 10% per annum)
- b) Terminal value of initial investment (after 15 years from now) (30% of initial capital cost)

Outflows

- c) Initial capital cost (Rs.7,80,000)
- d) Cost of Repair and Maintenance (Rs.70,100 in the initial year and expected to increase @ 5% per annum)
- e) Cost of maintenance of civil work and other infrastructural facilities (2% of capital cost in years 2 and 3, 3% in years 4 to 7, and 5% from years 8 onwards).

**Table 16: Computation of NPV and IRR on the basis of Expected Cash Flows
(Financial Point of View)**

Year	Addl. Revenue Generated (based on increase @ 10% p a)	Terminal Value	Initial Capital Cost	Cost of Repair & Maintenance (based on increase @ 5% p a)	Rate of Increase in the Maintenance cost of civil work:	Cost of Maintenance of Civil Work (based @ 2% of initial investment in years 2&3 and 5% thereafter)	Net Cash Flow
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
0			780000				(780000)
1							0
2	143760			70100	0.02	15600	58060
3	158136			73605	0.02	15600	68931
4	173950			77285	0.03	23400	73205
5	191345			81150	0.03	23400	86795
6	210479			85207	0.03	23400	101872
7	231527			89467	0.03	23400	118660
8	254680			93941	0.05	39000	121739
9	280148			98638	0.05	39000	142510
10	308163			103570	0.05	39000	165593
11	338979			108748	0.05	39000	191231
12	372877			114186	0.05	39000	219691
13	410164			119895	0.05	39000	251270
14	451181			125890	0.05	39000	286291
15	496299	234000		132184	0.05	39000	559115
NPV = 0; IRR = 12% per annum							

Based on a cost of capita of 12%, the NPV of the project is Rs.0. However, with changes in the cost of capital, the NPV of the project is as follows:

Table 17: Impact of Changes in Cost of Capital on Net Present Value

Cost of Capital	NPV (in Rs.)
0.06	544019
0.08	319995
0.10	142222
0.12	--
0.14	(114691)
0.15	(163666)
0.16	(207904)

Additional revenue arising due to the proposed investment on infrastructural facilities is required to be Rs.1,43,760 per annum in the initial year. However, if this falls short of the expectations, NPV becomes negative. In the tables below, the NPV and IRR are given for different amounts of additional revenue generated in the initial year ranging from Rs.110000 to as high as Rs.155000 along with the rates of growth in the revenues ranging from 5% per annum to 20% per annum.

Table 18 : Table Giving NPV at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)					
	110000	116000	125000	135000	145000	155000
0.05	(596271)	(550745)	(482457)	(406581)	(330705)	(254829)
0.06	(551275)	(503295)	(431325)	(351359)	(271392)	(191426)
0.08	(451237)	(397801)	(317646)	(228586)	(139525)	(50464)
0.10	(336029)	(276308)	(186728)	(87193)	12341	111875
0.12	(203227)	(136262)	(35816)	75791	187398	299006
0.14	(50032)	25289	138269	263803	389337	514871
0.15	35204	115173	235128	368410	501693	634975
0.20	566714	675675	839117	1020718	1202320	1383922

Table 19 : Table Giving IRR at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)					
	110000	116000	125000	135000	145000	155000
0.05	(0.025)	(0.010)	0.011	0.032	0.051	0.068
0.06	(0.005)	0.009	0.029	0.048	0.067	0.084
0.08	0.030	0.043	0.060	0.079	0.096	0.111
0.10	0.060	0.072	0.089	0.106	0.122	0.137
0.12	0.088	0.099	0.115	0.131	0.146	0.161
0.14	0.113	0.124	0.139	0.154	0.169	0.183
0.15	0.125	0.135	0.150	0.166	0.180	0.194
0.20	0.180	0.90	0.204	0.219	0.233	0.246

Accumulations in the Sinking Fund

Surpluses of revenues over expenditure can be used for further expansion of facilities in the market and for providing additional facilities to sellers and buyers. These funds can be invested in safe and profitable investment avenues with a view to get a lump sum amount of money which can be used for replacement of infrastructural facilities when they get decayed and outdated. The deposits in the fund are expected to be as follows, depending upon the rate of interest earned on investments:

Table 20: Table giving accumulated value of Deposits made in the Sinking Fund at Different Rates of Interest, as at the end of 15 years

Rate of Interest	Revenue of the Initial Year (Rs. in Lakh)					
	110000	116000	125000	135000	145000	155000
0.08	20.37	22.95	26.82	31.13	35.43	39.73
0.09	21.26	23.99	28.10	32.65	37.21	41.77
0.10	22.21	25.11	29.46	34.29	39.12	43.96
0.11	23.22	26.30	30.91	36.04	41.17	46.30
0.12	24.30	27.57	32.47	37.92	43.37	48.82
0.13	25.46	28.93	34.14	39.93	45.73	51.52
0.14	26.69	30.39	35.93	42.09	48.25	54.41
0.15	26.02	31095	37.85	44.41	50.96	57.52

ECONOMIC ANALYSIS

The following intangible benefits of the investment are particularly noteworthy:

1. Increase in the value of transactions carried out in the market
2. Benefits for women

3. Technology dissemination and technology development
4. Reduction in spoilage
5. Dissemination of market intelligence
6. Encouragement in the trade of agricultural and horticultural produce

As is quite obvious, if we take into consideration the impact of the above mentioned intangible factors on the NPV or IRR of the project, then investment on infrastructure in a rural market becomes a highly profitable proposition. Detailed calculations incorporating various aspects of social cost benefit analysis have not been carried out.

We have considered in this study the financial dimensions of the project and have gathered information relating to financial viability. Ultimate success of the project would depend on how imaginatively the project is managed in all its aspects. In this regard, sound financial management is of great importance.

There are considerable moral and cultural benefits accruing from the investment. Such investment cannot be looked as an instrument merely for solving the problems of poverty and backwardness. The real contribution of the investment is in terms of enhancing the quality of life of the people in the region. The project would be advantageous from different view points.

Some such non-tangible benefits accruing from investment in the project are detailed below:

1. Markets are held under unhygienic conditions as at present. Food articles, vegetables are kept under exposed conditions and become carriers of diseases and

ailments. The project would create healthy and hygienic conditions and thereby the physical well being of the people would be improved.

2. Market is a place of social interaction. It is a venue where people belonging to the region converge for a day or two in a week and buy articles of daily consumption. Improved condition in the market enables people to buy good quality products and thus the quality of life would be improved.
3. Political and social reform activities are conducted through these markets. Improved conditions in the market would attract more and more people to come to the market and derive benefits.
4. Improved conditions in the market could lead to increased business activities and increased arrival of articles of consumption. More business transactions would be carried out through the market and consequently more employment as well as income generation opportunities would be opened up.
5. Consciousness about new products and technology, etc. would be spread through the market. This would lead to improvement in the living standards of people. Companies can launch new products and processes suited for local consumption through these markets.
6. Climatic conditions reach extreme level during summer, winter and rainy seasons. Conditions become extremely bad particularly during the rainy season and the arrivals of articles is adversely affected. During summer also, when temperature level reaches high, it becomes very difficult both for the traders as well as the customers to visit the market. During winter season also, chilly winds prevent

customers and traders to visit the market. Improved conditions would increase the number of days during which the markets are held.

7. When markets are not held regularly or when customers do not arrive in adequate numbers, agricultural produce particularly the perishable vegetables get spoiled or they have to be sold at low price resulting into loss for the producers as well as consumers. Poor and vulnerable sections of the society are particularly harmed on account of poor conditions in the market.
8. Improvement in the market would lead to increased economic activity in the region. It would lead to more efficient and effective utilization of the natural as well as man-power resources available in the region.
9. Cultural activities would be encouraged through improved working conditions. Social welfare and reform activities can also be carried out more easily by improving the conditions in the market.

In a nutshell, the conditions in the market indicate the level of development of civilization. The investment under consideration is a contribution towards civilizational development and thus carries within it several non-financial and non-economic benefits.

If these are taken into consideration, the true value of NPV and IRR is much higher than has been computed in the study. This is shown in the table below. Here we have added an amount equal to 10% of the incremental trading caused due to generation of infrastructural facilities in the market. Savings caused due to reduction in spoilage @ 2% of the additional trading have also been added.

Table 21 : Computation of NPV and IRR on the basis of Economic Analysis

Cash Flow on the basis of Financial Analysis	Benefits of Increase in Trading	Benefit due to Reduction in Spoilage	Total Cash Flow
58060	48108	9622	115790
68931	50513	10103	129547
73265	53039	10608	136912
86795	55691	11138	153625
101872	58476	11695	172043
118660	61399	12280	192339
121739	64469	12894	199103
142510	67693	13539	223742
165593	71078	14216	250886
191231	74631	14926	260789
219691	78363	15873	313727
251270	82281	16456	350007
286291	86395	17279	389966
559115	90715	18143	667973
NPV = 438029; IRR = 18.367%			

WORDS OF CAUTION

Financial viability of the project depends primarily on :

1. Surplus of Revenue over expenses (Net Cash Flow); and
2. The cost of capital.

In the Table-22 given below, we have calculated the requirements of net cash flow based on different life spans of the project ranging between 15 to 40 years and on the basis of cost of capital ranging between 5% to 18% per annum for an initial investment of Rs.7,80,000 on the infrastructural facilities in the market. The results are

quite revealing in the sense that if the market fails to generate a minimum revenue as given in the table, the investment would not be financially viable proposition.

Table 22 : Table Giving Equivalent Annual Cost for Different Life Span of the Project at Different Costs of Capital

Cost of Capital (k)	Life of Project (n) (in Years)						
	15	20	25	30	35	40	
0.05	75147	62589	55343	50740	47636	45457	
0.06	80311	66004	61017	56666	53800	51840	
0.08	91127	79445	73069	69285	66927	65411	
0.10	102550	91619	85931	82742	80878	79762	
0.12	114523	104425	99450	96832	95407	94617	
0.15	133393	124614	120666	118794	117885	117438	
0.16	139899	131560	127930	126271	125496	125130	
0.18	153194	145720	142677	141386	140829	140587	

APPENDIX

MATHEMATICAL APPROACH INVOLVED IN THE APPRAISAL OF INVESTMENT ON INFRASTRUCTURE IN A RURAL MARKET

Let the initial investment on the development of infrastructural and public utilities in a market be Rs. 1. It takes about one year to complete the construction of the facilities and these are available for use after a period of one year since construction commences. It is assumed that incremental expenditure on maintenance of the facilities is incurred all at the end of every year and commences from the end of 2 years since construction starts. This same logic holds for incremental revenues also. The gap between incremental revenues and incremental expenditures (i.e. surplus of revenues over expenditures) is assumed to be Rs.X in the beginning (i.e. at the end of 2 years since construction etc. starts) and this increases in real term, @ g per annum. Useful life span of the initial investment is taken to be 14 years with an assumed depreciation @ 5% per annum simple, so that the terminal value of the infrastructural facilities created in the first year would remain to be 30% of the initial investment 1. Cost of capital is assumed to be 'k' per annum.

Based on the above logic,

$$I = \frac{X}{(1+k)(g-k)} \cdot \frac{1+(1+g)^{14}}{[(1+k)^{15} - 0.30]} \quad X, \quad \text{and}$$

$$X = \frac{[(1+k)^{15} - 0.30] (1+k)(g-k)}{[(1+k)^{15} \left(\frac{(1+g)^{14}}{(1+k)^{14}} - 1 \right)]} I$$

If k and g are assumed to be 12% and 10% respectively, the above expression becomes

$$I = 10.53 \cdot X \cdot (Bx), \text{ or equivalently}$$

$$X = 0.095 \cdot I \quad (C.I.)$$

If cost of capital (k) ranges between 6% to 15% and the growth in surplus (g) ranges between 5% to 20%, the following matrix giving the values of the coefficients involved in the above expression $X = .095 \cdot I$ is generated.

Table 23: Table giving the values of 'C' in the expression $X = C \cdot I$, at different rates of cost of capital and rates of growth

	$k = \text{Cost of capital}$						
	0.0600	0.0800	0.1000	0.1200	0.1400	0.1500	
0.0500	0.0746	0.0900	0.1067	0.1246	0.1437	0.1538	
0.0600	NA	0.0849	0.1009	0.1182	0.1367	0.1465	
0.0800	0.0620	NA	0.0901	0.1061	0.1234	0.1326	
0.1000	0.0546	0.0668	NA	0.0950	0.1110	0.1195	
0.1200	0.0479	0.0589	0.0712	NA	0.0995	0.1074	
0.1400	0.0419	0.0518	0.0629	0.0753	NA	0.0962	
0.1500	0.0392	0.0486	0.0591	0.0709	0.0840	NA	
0.2000	0.0277	0.0348	0.0429	0.0520	0.0624	0.0680	

($X = \text{Surplus of revenue over expenditure required to be generated at the end of year 2}$, $I = \text{Initial capital outlay}$, $C = \text{Coefficient values computed on the basis of the assumptions stated in the model}$)

The above table acts as a ready reckoner to ascertain the amount of surplus of revenues over expenditures required to be generated on annual basis with a constant annual growth rate of 'g' and a given cost of capital 'k' in order to justify (on the grounds of financial viability) the initial investment of Rs.1 in a market. As an example, if initial capital outlay on a market is Rs.10 lakhs, then .095 X Rs.1000000= Rs.95000 is the annual surplus of revenues over expenditures which is required to be generated at the end of the initial year (i.e. year 2) in which facilities are made available for use. This should grow annually @ 10% per annum ($g=.10$) in order to make the project viable from financial point of view.

Reciprocals of the values given in the table 21 above, gives the values of B in the expression $I = BX$. Results are as follows:

Table 24: Table giving the values of 'B' in the expression $I = BX$ at different rates of cost of capital and rates of growth

g = rate of growth in surplus of revenues over expenditure	k = Cost of capital					
	0.06	0.08	0.10	0.12	0.14	0.15
0.05	13.40	11.11	9.38	8.03	6.96	6.50
0.06	NA	11.77	9.91	8.46	7.31	6.83
0.08	16.13	NA	11.09	9.42	8.10	7.54
0.10	18.32	14.98	NA	10.53	9.01	8.37
0.12	20.88	16.97	14.05	NA	10.05	9.31
0.14	23.85	19.29	15.89	13.28	NA	10.39
0.15	25.52	20.58	16.91	14.10	11.91	NA
0.20	36.04	28.73	23.32	19.21	16.03	14.71

The above table acts as a ready reckoner to ascertain the maximum amount of capital investment, which should be made on the expectation of a given amount of surpluses of revenues over expenditures. As an example, if it is expected that a surplus of Rs.95000 can be generated in the initial year, then the investment will remain financially viable upto a maximum investment of $Rs.10.53 \times 95000 = Rs.10$ lakhs. An initial investment of an amount less than Rs.10 lakhs, which can generate a surplus of at least Rs.95000 in the initial year, is of course, a good investment proposition. The above result is true for a cost of capital 12% and the annual growth of surplus of revenues over expenditure @ 10% per annum. Other values given in the table are interpreted similarly.

**SARAIN MOHIUDDINPUR
RURAL MARKET**

BLOCK SHAHGANJ

DISTRICT JAUNPUR

I. LOCATION OF THE SARAIN MOHIUDDINPUR MARKET

The Sarain Mohiuddinpur rural market is the daily market, held at the village Sarain Mohiuddinpur. The market is located on Shahganj-Sultanpur road at the distance of 7 kms. from Shahganj Collectorate. On the left side of main road, a link road connects to Khutahan block and on right side, a link road goes towards Akhand Nagar. This market is held on the main road sides of and on the sides of these two link roads.

The hinterland of Sarain Mohiuddinpur rural market is quite large which consists of following nine (9) villages:

Name of the Village	Distance from the Market (Kms.)
1. Jangeepur	0.50
2. Dehri	5.00
3. Mittoopur	5.00
4. Husainabad	3.00
5. Johruddinpur	2.00
6. Baraud	3.00
7. Gorhoopur	3.00
8. Baragaon	1.00
9. Gauspur	1.00

II. STRUCTURE OF THE MARKET

The research team of our Institute counted all the shops of market on a market day. Thus, it became evident that there are 85 shops in which 63 shops are of vegetables, 6 of fruits, 11 of meat & fish and 5 of small eatables. Out of the total 85 shops, 17 shops (20 per cent) are owned by the females. The female shop owners are mainly sellers of vegetables. The complete structure of Sarain Mohiuddinpur market has been shown in Table-1.

Table-1 : Structure of the Sarain Mohiuddinpur Market

COMMODITIES	TOTAL SHOPS			PERCENTAGE OF TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	48(76.19)	15(23.81)	63(100.00)	70.59	88.24	74.12
Fruits	5(83.33)	1(16.67)	6(100.00)	7.35	5.88	7.06
Meat, Fish	11(100.00)	--	11(100.00)	16.18	--	12.94
Small eatables	4(80.00)	1(20.00)	5(100.00)	5.88	5.88	5.88
Total	68(80.00)	17(20.00)	85(100.00)	100.00	100.00	100.0

Note : Figures in brackets indicate percentage.

Source: Based on field data.

III. SAMPLE OF THE MARKET

The sample of study constituted around 32 per cent of all shops of market. In case of agricultural commodities, 30 per cent of vegetables shops and 50 per cent of fruits shops were taken up in the sample. Out of the total shops owned by the females, 25 per cent were taken in the sample. In this way, the proportion of shops owned by the males and females constituted 34 per cent and 25 per cent respectively as shown in Table-1.1.

Table-1.1 : Sample of the Market

COMMODITIES	SELECTED SAMPLE SHOPS			PERCENTAGE OF SAMPLE SHOPS IN TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	16(84.21)	3(15.79)	19(100.00)	33.33	20.00	30.16
Fruits	2(66.67)	1(33.33)	3(100.00)	40.00	100.00	50.00
Total	18(81.82)	4(18.18)	22(100.00)	33.96	25.00	31.88

Note : Figures in brackets indicate percentage.

Source: Based on field data.

IV. COMPOSITION OF THE MARKET

In the total market structure of Sarain Mohiuddinpur market, sixty per cent sellers are farmers and remaining forty per cent are traders. The farmers are mainly involved in the sale of vegetables while non-agricultural commodities are being sold by the traders. In Table-2, farmers/traders composition in the structure of Sarain Mohiuddinpur market has been presented.

Table-2: Farmers and Traders Composition in the Sarain Mohiuddinpur Market

Commodities	Farmers	Traders	Total
Vegetables	49(77.78)	14(22.22)	63(100.00)
Fruits	2(33.33)	4(66.67)	6(100.00)
Meat and Fish	--	11(100.00)	11(100.00)
Small eatables	--	5(100.00)	5(100.00)
Total	51(60.00)	34(40.00)	85(100.00)

Note : Figures in brackets indicate percentage.

Source : Based on field data.

V. COMPOSITION OF THE SAMPLE

Keeping in view the composition of farmers and traders in the structure of Sarain Mohiuddinpur market, 15 farmers and 7 traders were selected as sample of study. In case of vegetables, 14 farmers and 5 traders were selected while in case of fruits, 1 farmers and 2 traders were taken into the sample as shown in the following Table-3.

Table-3: Farmers and Traders Composition in the Sample of Sarain Mohiuddinpur Market

Commodities	Farmers	Traders	Total
Vegetables	14(73.68)	5(26.32)	19(100.00)
Fruits	1(33.33)	2(66.67)	3(100.00)
Total	15(68.18)	7(31.82)	22(100.00)

Note : Figures in brackets indicate percentage.

Source : Based on field data.

VI. TURN OVER OF AGRICULTURAL PRODUCE IN SARAIN MOHIUDDINPUR MARKET

The data collected from the sample shops showed that on an average, 43 kgs. of vegetables are sold per shop on a market day followed by 13 kgs. of fruits and 39 kgs. of all agricultural produce. On this basis, total quantity sold by all shops per market day comes to 2715 kgs. of vegetables, 80 kgs. of fruits and 2795 kgs. of all agricultural produce as evident in Table-4.

Table-4: Actual Turn Over of Agricultural Produce of Sarain Mohiuddinpur Market

Commodities	No. of Shops in the Sample	Total Qty. Sold per Market Day by Sample Shops (Kg.)	Average Qty. sold by sample shops (Kg.)	No. of Total shops in the market	Total Qty. sold by all shops per market day (Kg.)
Vegetables	19	819	43.10	63	2715
Fruits	3	40	13.33	6	80
All Agricultural Produce	22	859	39.05	69	2795

Source : Based on field data.

One of the conditions to study a rural market for feasibility study is that the selected market should have turn over of more than 1000 MT per annum of all agricultural commodities. This pre-condition of makret selection is justified in case of Sarain Mohiuddinpur market because the estiamte as shown in Table-5 showed that this

market has, at present, annual turnover of 1020 MT per annum of agricultural commodities. The annual turnover of vegetables has been estimated to be 991 MT followed by 29 MT of foodgrains and 1020 MT of all agricultural commodities.

Table-5 : Annual Turn Over of All Agricultural Produce in the Sarain Mohiuddinpur Market

Commodities	Turn Over (MT)
Vegetables	990.98
Fruits	29.20
All Agricultural Produce	1020.18

Source : Based on field data.

VII. PERSONS INVOLVED IN BUYING AND SELLING

According to our enumeration, there are 85 shops in Sarain Mohiuddinpur market per market day. In these shops, roughly one person has been found to be involved in selling of commodities. The situation is similar in respect of each of the commodities.

The data also shows that 1878 persons per market day purchase from all the shops of five commodities. It is evident that on an average, 22 persons have been found to be purchasing from each shop as reflected from Table-6.

Table-6: Total and Average Number of Persons Involved in Selling and Buying Per Market Day in Sarain Mohiuddinpurr Market

Commodities	No. of Persons Involved in Selling	Average No. of Persons Involved in Selling	Total No. of Persons Involved in Buying	Average No. of Persons Involved in Buying (No.)
Vegetables	66	1.05	1149	23
Fruits	7	1.17	120	20
Meat, Fish, Egg	14	1.27	209	19
Small Eatables	5	1.00	100	20
Total	92	1.08	1878	22

Source : Based on field data.

VIII. REVENUE POTENTIAL OF THE MARKET

It was reported by the farmers/traders of Sarain Mohiuddinpur market that they do not pay market fee at present. It is being estimated that if a minimum of Re.1/- per shop per market day is collected from each shop owner of the market, how much revenue can be realized. It becomes evident in Table-7, that a total amount of Rs.31,025 per annum can be obtained from this market by imposing Re.1/- per shop per market day.

BLOCK : SHAHGANT
DISTRICT : JAUNPUR

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Table-7 : Present Potential of Market Fee in Sarain Mohiuddinpur Market

Commodities	Total Shops	Potential Market Fees Per Market Day (Rs.)	Potential Market Fee Per Annum (Rs.)
Vegetables	63	63	22995
Fruits	6	6	2190
Meat & Fish	11	11	4015
Small eatables	5	5	1825
Total	85	85	31025

Source : Based on field data.

IX. MODE OF TRANSPORT USED

The farmers/traders who bring different commodities for sale in the Sarain Mohiuddinpur market use three types of transport namely, cycle, trolley and jeep. The cycle is reported to be used by around 41 per cent of sample farmers/traders followed by 19 per cent of traders who use trolley and jeep each to bring their commodities for sale in the market. It is also evident that around 23 per cent farmers/traders travel on foot to carry their commodities for sale in this market. In Table-8, the sample farmers/traders have been classified according to the mode of transport used by them.

Table-8: Farmers/Traders Using Different Mode of Transport to Bring Agricultural Commodities

Commodities	Cycle	Trolleys	Jeep	On Foot	Total (No.)
Vegetables	8(42.11)	3(15.77)	4(21.05)	4(21.05)	19(100.00)
Fruits	1(33.33)	1(33.33)	--	1(33.33)	3(100.00)
Total	9(40.91)	4(18.18)	4(18.18)	5(22.73)	22(100.00)

Note : Figures given in brackets are percentage.

Source : Based on field data.

X. DISTANCE COVERED TO REACH THE MARKET

The average distance covered by the farmers/traders to reach this market is 2.25 kms. as shown in Table-9. It is 2.08 kms. in case of vegetables sellers and 3.33 kms. of fruits sellers. The distribution of sample farmers/traders according to the distance covered by them shows that around 45 per cent of them cover the distance of less than one km. All the farmers/traders come to this market from within the distance of 5 kms.

Table-9 : Classification of Sample Farmers/Traders According to the Distance Covered to reach the Sarain Mohiuddinpur Market

Commodities	No. of Traders/Farmers Distance Covered Area				Average Distance Covered (Km.)
	0-1 (km.)	1-3 (kms.)	3-5 (km.)	Total	
Vegetables	9(47.37)	6(31.58)	4(21.05)	19(100.00)	2.08
Fruits	1(33.33)	--	2(66.67)	3(100.00)	3.33
Total	10(45.45)	6(27.27)	6(27.27)	22(100.00)	2.25

Note : Figures in brackets indicate percentage.

Source: Based on field data.

XI. EXISTING FACILITIES IN THE MARKET

As observed in the market that all necessary facilities are not therein. This is so because the market is held on the sides of main road and two link roads. Only drinking water is available through hand-pump.

XII. NEED OF IMPROVED FACILITIES

As observed in the market, there is lack of infrastructural facilities. Therefore, utmost need is to provide improved facilities because all the sample farmers/traders have expressed their desire to have such facilities as evident from Table-10.

It becomes evident that farmers/traders selling different commodities in the market need improved facilities and all of them are willing to pay higher market fee for using the facilities.

Table-10 : Need of Improved Marketing Facilities in Sarain Mohiuddinpur Market

Commodities	Total No. of Farmers Shop	No. of Farmers Shops requiring improved facilities	No. of farmers willing to pay higher market fee	Total No. of Traders shop	No. of traders shop requiring improved facilities	No. of traders willing to pay higher market fee
Vegetables	14	14 (100.00)	14 (100.00)	5	5 (100.00)	5 (100.00)
Fruits	1	1 (100.00)	1 (100.00)	2	2 (100.00)	2 (100.00)
Total	15	15	15	7	7	7

Note : Figures in brackets indicate percentage.
Source : Based on field data.

XIII. TYPE OF MARKETING FACILITIES REQUIRED

Since infrastructural facilities have been found to be lacking in this market, the sample farmers/traders were enquired by our research team that what type of facilities they need? The replies given by them have been presented in Table-11.

It became evident from the table that the facilities namely drinking water, shed, platform, electricity, store, cycle and drainage are needed by most of the sellers in the shop. The female shop owners, besides requiring these facilities, also want to have toilet and place to sit.

Table-11 : Type of Marketing Infrastructural Facilities Required by the Farmers/ Traders of Sarain Mohiuddinpur Market

Commodities	Total No. of Farmers/ traders	Place	Drinking Water	Shed	Platform	Electricity	Storage	Toilet	Permanent shop	Cycle Stand	Proper drainage
Vegetables	19	9 (47.37)	19 (100.00)	11 (57.89)	17 (89.47)	19 (100.00)	11 (57.89)	8 (42.11)	8 (42.11)	16 (84.21)	19 (100.00)
Male	16	8 (50.00)	16 (100.00)	10 (62.50)	15 (93.75)	16 (100.00)	10 (62.50)	5 (31.25)	6 (37.50)	16 (100.00)	16 (100.00)
Female	3	1 (33.33)	3 (100.00)	1 (33.33)	2 (66.67)	1 (100.00)	1 (33.33)	3 (100.0)	2 (66.67)	—	3 (100.00)
Fruits	3	2 (66.67)	3 (100.00)	2 (66.67)	2 (66.67)	3 (100.00)	2 (66.67)	2 (66.67)	2 (66.67)	2 (66.67)	3 (100.00)
Male	2	1 (50.00)	2 (100.00)	1 (50.00)	1 (50.00)	2 (100.00)	2 (100.00)	1 (50.00)	2 (100.0)	2 (100.00)	2 (100.00)
Female	1	1 (100.0)	1 (100.00)	1 (100.0)	1 (100.0)	1 (100.00)	—	1 (100.0)	—	—	1 (100.00)
Total	22	11 (60.00)	22 (100.00)	13 (59.09)	19 (86.36)	22 (100.00)	13 (59.09)	10 (45.45)	10 (45.45)	18 (81.82)	22 (100.00)
Male	18	9 (50.00)	18 (100.00)	11 (61.11)	16 (88.89)	18 (100.00)	12 (66.67)	6 (33.33)	8 (44.44)	18 (100.00)	18 (100.00)
Female	4	2 (50.00)	4 (100.00)	2 (50.00)	3 (75.00)	4 (100.00)	1 (25.00)	4 (100.0)	2 (50.00)	—	4 (100.00)

Note : Figures in brackets indicate percentage.

Source : Based on field data.

XIV. EXPECTED INCREASE IN ARRIVALS AFTER MARKET IMPROVEMENT

It has become evident that (i) market infrastructural facilities are lacking in the market and (ii) the farmers/traders want improved facilities by paying reasonable market fee. If market is developed, it is natural that volume of trade in the market would increase. It was tried to assess that how increase in turnover of agricultural commodities would result on account of provision of improved facilities in the market. The analysis has been presented in Table-12.

It becomes evident that arrivals of vegetables, fruits and all agricultural commodities are expected to go up by around 176 per cent. This increase in arrival will come due to increase in the present arrival and increase in the existing number of shops.

Table-12: Expected Increase in Arrivals of Agricultural Produce After Market Improvement in the Sarain Mohiuddinpur Market

Commodities	Vegetables	Fruits	All Agricultural Produce
Number of Sample Shops	19	3	22
Total Qty. expected to be sold by sample shops per market day (kg.)	1156	60	1216
Average Qty. expected to be sold by sample shops per market day (kg.)	60.84	20	55.27
Total No. of Shops in the market	63	6	69
Total Qty. Expected to be sold per market day in existing shops (kg.)	3832.92	120	3952.92
Expected increase in number of new Shops	60	5	65
Expected turnover of new entrants (kg.)	3650.40	100	3750.40
Total expected increase in turnover per day (kg.)	7483.32	220	7703.32
Actual Qty. sold per market day (kg.)	2715	80	2795
Percentage Increase	175.63	175.00	175.61

Source : Based on field data.

XV. EVALUATION OF ECONOMIC BENEFITS EMANATING FROM IMPROVEMENT IN THE SARAIN MOHIUDDIN MARKET

Apart from channelising fresh agriculture produce from farm level to final consumers there are other economic benefits which are likely to be generated in the process of market improvements. In fact these benefits should be considered as an important factor to take up the task of Rural Market Improvement Programmes. There are many economic benefits emanating from improved Rural Market infrastructure. These may broadly be grouped under following categories:

1. As an outcome of market improvements, increased volume of trade results in comparatively lower or constant or higher per unit marketing cost.
2. Improved efficiency of market operations in the form of better product display, better facilities and availability of more marketing hours for the buyers and sellers resulting in higher per unit price of agricultural produce.
3. Reduction in spoilage of perishable crops; vegetables and fruits with the availability of improved rural marketing infrastructure.
 - I. It is very logical to put up the idea before a farmer/trader having shop in the market that for availing better market infrastructure they should bear higher market fee. For that matter, the shop owners (traders as well as farmers) have convincingly agreed to pay higher market fee for availing improved market facilities. Besides, additional market fee would also be realized from the new farmers/traders who would join the market after its improvement.

For this matter, it calculated in the financial analysis (Table-16) that how much market fee is required to be generated after the improvement of Sarain Mohiuddinpur market on viability consideration. It was found that Rs.2.45 per shop per market day should be collected. If this is taken as a basis of market fee collection, afer the development of this market, then a total of Rs.369 per shop per market day is required to be collected as shown in Table-13.

Table-13 : Potential Market Fee and Increased Market Fee Required to be paid by Farmers/Traders of Sarain Mohiuddinpur

Commodities	Total No. of Shops	Present Potential of Market Fee (Per Market Day) (Rs.)	Expected Total No. of Shops After Market Improvement	Total Increased Market Fee Required for Market Improvements (Per Market Day) (Rs.)
Vegetables	63	63	123	302.58
Fruits	6	6	11	27.06
Meat & Fish	11	11	11	27.06
Small eatables	5	5	5	12.30
Total	85	85	150	369.00

Source : Based on field data

The table shows that the present fee potential of the market can be estimated to be Rs.85 per market day on the basis of collecting Re.1.00 per shop per market day. The expected increase in the number of shops is estimated to be 150 after market improvement and for the viability of market, Rs.2.45 per shop per market day is required to be collected. The imposition of Rs.2.45 per shop per market day seems to be

realistic amount. The farmers/traders of this market have also expressed their view to easily pay Rs.2.45 per market day if market is developed at the new site.

However, due to realisation of Rs.2.45 per shop per market day, per unit market cost would be increased by 33 per cent. The present estimated per unit market cost seems to Re.0.03 which will go up to Re.0.04 after market improvement as shown in Table-14.

Table-14 : Change in Marketing Cost Before and After Market Improvement

Commodities	Present Market Turn Over of Sample Shops (Per Market Day) (Kg.)	Total Fee Potential of Sample Shops (Per Market Day) (Rs.)	Expected Market Turn-over after market improvement in sample shops (Kg.)	Total Required Collection as Market Fee from Sample Shops (Rs.)	Percentage Increase in Fee Collection after Market Improvement	% Increase in Per Unit Marketing Cost
Vegetables	819	19(0.02)	1156	46.74(0.04)	146.00	100.00
Fruits	40	3(0.08)	60	7.38(0.12)	146.00	50.00
All Agricultural Produce	859	22(0.03)	1216	54.12(0.04)	146.00	33.33

Note : Figures in brackets show per unit marketing cost.

Source : Based on field data.

Thus, it becomes evident that after the development of Sarain Mohiuddinpur market, the volume of trade would be increased and per unit cost of sale would also go up. But the increase in fee is not significant in view of increase in the volume of business after market improvement.

As a result of improvement of Sarain Mohiuddinpur market, farmers/traders are expected to maintain the quality of their commodities to be sold in the market. In other words, they will be able to bring their produce in this market in a more presentable manner. Buyers will also remain satisfied while purchasing under improved market conditions. Hence, sellers may justify at least 5 per cent increase in the price of their produce. As there will be no substantial increase in per unit marketing cost, this hike in price would be a net gain to sellers in the market as the following estimate in Table-15 indicates.

Table-15 : Estimation of Net Gain in Marketing Under Market Improvement

Commodities	Estimated Total Value of Commodities sold per market at present (Rs.)	Estimated value of commodities to be sold per market day after market improvements (at current prices) (Rs.)	Estimated Value of Commodities to be sold after market improvements 5% high prices (Rs.)	Net gain per market day (Rs.)	Net gain per annum (Approx.) (Rs.)
Vegetables	6787.50	1870.3	19643.72	935.42	341428.30
Fruits	880.00	2420.0	2541.00	121.00	44165.00
Total	7667.50	21128.3	22184.72	1056.42	385593.30

Source : Based on field data.

XVI. FINANCIAL AND ECONOMIC APPRAISAL OF INVESTMENT IN RURAL MARKET OF SARAIN MOHIUDDINPUR

Introduction

Rural markets are a hub-centre of socio-economic activities in a region. Along with public services such as Primary Health Centre, Veterinary Hospital, Post Office, Bank, Educational Institutions, Play Ground, PCO, Police Station, etc., they provide a fillip to the tempo of social, cultural and economic growth of the region comprising of a number of villages from where buyers and sellers of goods and services are attracted to these markets.

Existing conditions in some such markets are far from satisfactory. A typical market may consist of some stalls of a temporary nature and sellers sit on ground and on chabutras of houses and shops, open to sky without any shed or cover. Quite often they are held once, twice or thrice a week during the afternoon hours. Some may be the daily markets also.

The products traded in such markets include vegetables, fruits, flowers, edible oil, spices, jaggery, foodgrains, meat, fish, ready made wears, chappals, sweets, chhats, general goods and services of cobblers, smiths, barbers, etc. Arrival of commodities in the market fluctuates, depending upon the season and other factors.

Catchment area of such rural markets comprises of a large number of smaller and big villages in the vicinity of the village in which the market is held. Total catchment area of such markets may cover a distance of some 6-8 kms. comprising of 10-15 villages or even more.

The following are some of the important infrastructure and public utilities usually required in such markets:

1. Pucca open platforms
2. Shaded platforms
3. Pucca Shops
4. Space for Market Information Centre and Office for Market Management Committee
5. Room for Security Guard
6. Place for parking of cycles, scooters, buggies, horse-carts, tractor-trolleys, etc.
7. Storage facility
8. Electrification
9. Drainage facility
10. Boundary wall and Fencing around the haat area with the gates
11. Construction of Roads
12. Cattle Shed with drinking water facilities
13. Drinking wader
14. Toilets
15. Place for waste disposal
16. Plantation of trees

Management of the Market

Quite often the rural market is managed by the Gram Panchayat which realizes 'Tehbazari' from the traders. Another alternative arrangement is that the contract is awarded to a contractor for a stipulated amount per period and the contractor collects

Tehbazari from the shopkeepers at predetermined rates. Gram Panchayat may form a "Market Management Committee" (MMC) to monitor the various activities of the market. The committee may take decisions on the mode of maintenance, management, rate of Tehbazari, method of its realization and settlement of disputes related to the market.

Construction of a market with covered and open pucca platforms, fencing around the area and facilities for storage, toilets, water supply, proper drainage and parking, etc. can bring about an improvement in the conditions in such rural markets. Shopkeepers are willing to pay the 'Tehbazari' at higher rates provided proper facilities are developed.

Financial Analysis of Investment in Infrastructure

Initial investment is required on land and on capital cost involved in the creation of infrastructural facilities described above. Land for rural market could be the land owned by the Gram Panchayat, so that no investment is required to be made on this count.

Upkeep of the infrastructure is a must for the sustainability and trouble-free services. Below we provide estimates of expenditure (both capital and revenue type) required to be made in Sarain Mohiuddinpur market located in Shahganj Block of Jaunpur district, for which this feasibility study is being carried out (For details of the mathematical approach involved in this, see the Appendix given at the end).

XVII. FINANCIAL ANALYSIS OF PROPOSED INVESTMENT IN SARAIN MOHIUDDINPUR MARKET

Here we evaluate financial viability for providing facilities for the improvement of infrastructural facilities and other amenities in the rural market of Sarain Mohiuddinpur. Parameters involved in the financial analysis are detailed below:

1. Initial Capital Investment

Since the Sarain Mohiuddinpur market, at present, lacks infrastructural facilities therefore substantial amount will have to be spent on the modernisation of the market. Platform/sheds need to be constructed, water supply is to be arranged and other infrastructural facilities are to be provided. All this would require capital expenditure. According to our estimate, Rs.9,40,000/- would be needed as initial capital, which will have to be spent over a time span of one year. This may be termed as initial capital investment. We also assume that the entire capital investment will be made instantaneously at the beginning of the year. This is not an unrealistic assumption.

2. Life Span of the Project

The market infrastructural facilities proposed to be provided in the Sarain Mohiuddinpur market would have usefulness for a fairly long period of time though depreciation is bound to take place with the passage of time. The actual life span of the project cannot be estimated with high degree of accuracy but on the basis of technical opinion of the Architect/Civil Engineer, it is assumed that the facilities proposed to be

provided would last for a period of at least 15 years. It may not be unrealistic to assume that the facilities provided would remain useful even for a period of 20 years and above. In case of Sarain Mohiuddinpur market we have taken the life span of the project to be 15 years. Thus, scrap value of the initial infrastructural facilities created at a cost of Rs.9,40,000/- has been treated as 30% of the initial capital cost, i.e. Rs.2,82,000.

3. Cost of the Capital

Cost of the capital for project is a critical factor which determines the viability of project. Cost of capital based on the competitive interest rates prevailing in the market would be too high if considered for this market. For socially desirable activities, it is even worthwhile to examine the financial viability at a relatively lower cost of capital. In practice also, the agencies involved in financing socially desirable activities encourage development of infrastructural facilities at a lower rate of capital cost. The projects so financed have plethora of social benefits, apart from financial benefits emanating from the project financed.

Keeping all this in view, 12 per cent annual cost of capital has been considered in the financial analysis of the Sarain Mohiuddinpur Market.

4. Cost of Repair and Maintenance

The proposed facilities to be provided in the market are bound to depreciate over the passage of time. Proper maintenance and upkeep of facilities in good condition is a social as well as economic necessity.

Keeping this objective in view, adequate provision has been made to account for the cost likely to arise on account of repair and maintenance. Items of expenditure under this head are as follows:

- (a) Expenditure on labour, materials and overheads for repair and maintenance of facilities;
- (b) Repair/Replacement of water pumps, electrical equipments and accessories etc. from time to time;
- (c) Salaries and wages payable to persons employed for the upkeep of facilities created by the project.

Details of annual maintenance expenditure are as follows:

1.	Watchman for Security @ Rs.1500 per month	Rs.18,000
2.	Sweeper for cleaning for 365 days @ Rs.40 per day	Rs.14,600
3.	Electrical Maintenance for 365 days @ Rs.100 per day	Rs.36,500
4.	Maintenance of Handpump	Rs. 1,000
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Total		Rs.70,100
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The above expenditure is expected to increase @ 5% annually.

Technical estimates suggest that there would be zero expenditure on repair and maintenance of the project during the first year. It is assumed that during second and third years, 2 per cent of the initial investment would be required for repair and

maintenance. During the years 4 to 7, this will be 3% of the initial investment and thereafter @ 5 per cent of the initial capital investment will be needed for repair and maintenance of civil work and other infrastructural facilities till 15th year.

5. Revenues Arising from the Market

The completion of the market improvement programme would result into substantial improvement in the working conditions of the Sarain Mohiuddinpur market. Farmers and traders would get a sizeable and respectable place to sit in and transact the business. They would be saved from the inconvenience arising due to limited space, open sale and bad weather. There is always a good-will value associated with a good looking shop.

As a result of improved facilities in the market, it is expected that on account of availability of improved facilities the users of market would be willing to pay an increased market fee and rent for using these facilities.

Views of farmers/traders were solicited on the required increase in the market fee recoverable from them after market improvement programme is carried out. Incremental increase in revenue due to creation of infrastructural facilities has been put at Rs.1,34,500 in the initial year. This is expected to go up @ 10% per annum.

NPV (Net Present Value) of Investments in the Projects

Based on the assumptions stated above, the sources of cash inflows and outflows are as follows:

Inflows

- (a) Expected increase in revenue (Beginning at Rs.1,34,500 per annum and going up @ 10% per annum)
- (b) Terminal value of initial investment (after 15 years from now) (30% of initial capital cost)

Outflows

- (c) Initial capital cost (Rs.9,40,000)
- (d) Cost of Repair and Maintenance (Rs.33560 in the initial year and expected to increase @ 5% per annum)
- (e) Cost of maintenance of civil work and other infrastructural facilities (2% of capital cost in years 2 and 3, 3% in years 4 to 7, and 5% from years 8 onwards).

**Table 16: Computation of NPV and IRR on the basis of Expected Cash Flows
(Financial Point of View)**

Year	Addl. Revenue Generated (based on increase @ 10% p.a.)	Terminal Value	Initial Capital Cost	Cost of Repair & Maintenance (based on increase @ 5% p.a.)	Rate of Increase in the Maintenance cost of civil work	Cost of Maintenance of Civil Work (based @ 2% of initial investment in years 2&3 and 5% thereafter)	Net Cash Flow
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
0		940000					(940000)
1							0
2	134500			33560	0.02	18800	82140
3	147950			35238	0.02	18800	93912
4	162745			37000	0.03	28200	97545
5	179020			38850	0.03	28200	111970
6	196921			40792	0.03	28200	127929
7	216614			42832	0.03	28200	145582
8	238275			44974	0.05	47000	146301
9	262102			47222	0.05	47000	167880
10	288313			49583	0.05	47000	191729
11	317144			52063	0.05	47000	218081
12	348858			54666	0.05	47000	247193
13	383744			57399	0.05	47000	279345
14	422119			60269	0.05	47000	279345
15	464330	282000		63282	0.05	47000	314850
NPV = Rs.667; IRR = 12% per annum							

Based on a cost of capita of 12%, the NPV of the project is Rs.667. However, with changes in the cost of capital, the NPV of the project is as follows:

Table 17: Impact of Changes in Cost of Capital on Net Present Value

Cost of Capital	NPV (in Rs.)
0.06	631471
0.08	372382
0.10	166168
0.12	667
0.14	(133246)
0.15	(190581)
0.16	(242465)

Additional revenue arising due to the proposed investment on infrastructural facilities is expected to be Rs.1,34,500 per annum in the initial year. However, if this falls short of the expectations, NPV becomes negative. In the tables below, the NPV and IRR are given for different amounts of additional revenue generated in the initial year ranging from Rs.130000 to as high as Rs.175000 along with the rates of growth in the revenues ranging from 5% per annum to 20% per annum.

Table 18 : Table Giving NPV at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)					
	130000	135000	145000	155000	165000	175000
0.05	(351682)	(313744)	(237868)	(161992)	(86116)	(10241)
0.06	(298505)	(258522)	(178555)	(98589)	(18622)	61344
0.08	(180279)	(135749)	(46688)	42373	131434	220494
0.10	(44124)	5644	105178	204712	304246	403780
0.12	112825	168628	280235	391843	503450	615057
0.14	293873	356640	482174	607708	733242	858776
0.15	394606	461247	594530	727812	861095	994378
0.20	1022754	1113555	1295157	1476759	1658361	1639962

Table 19 : Table Giving IRR at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)					
	135000	145000	155000	165000	175000	
0.05	0.060	0.067	0.081	0.094	0.106	0.118
0.06	0.071	0.078	0.092	0.105	0.117	0.129
0.08	0.093	0.100	0.113	0.126	0.138	0.150
0.10	0.114	0.121	0.134	0.146	0.158	0.169
0.12	0.134	0.141	0.154	0.166	0.178	0.189
0.14	0.154	0.160	0.173	0.185	0.197	0.208
0.15	0.163	0.170	0.182	0.195	0.206	0.217
0.20	0.209	0.216	0.228	0.240	0.251	0.262

Accumulations in the Sinking Fund

Surpluses of revenues over expenditure can be used for further expansion of facilities in the market and for providing additional facilities to sellers and buyers. These funds can be invested in safe and profitable investment avenues with a view to get a lump sum amount of money which can be used for replacement of infrastructural facilities when they get decayed and outdated. The deposits in the fund are expected to be as follows, depending upon the rate of interest earned on investments:

Table 20: Table giving accumulated value of Deposits made in the Sinking Fund at Different Rates of Interest, as at the end of 15 years

Rate of Interest	Revenue of the Initial Year (Rs. in Lakh)					
	130000	135000	145000	155000	165000	175000
0.08	39.70	41.85	46.15	54.75	59.05	59.05
0.09	41.79	44.07	48.62	57.74	62.30	62.30
0.10	44.03	46.45	51.28	60.95	65.78	65.78
0.11	46.44	49.01	54.14	64.40	69.53	69.53
0.12	49.04	51.76	57.21	68.10	73.55	73.55
0.13	51.82	54.72	60.51	72.09	77.88	77.88
0.14	54.81	57.89	64.05	76.37	82.53	82.53
0.15	58.03	61.31	67.86	90.98	87.53	87.53

ECONOMIC ANALYSIS

The following intangible benefits of the investment are particularly noteworthy:

1. Increase in the value of transactions carried out in the market
2. Benefits for women
3. Technology dissemination and technology development
4. Reduction in spoilage
5. Dissemination of market intelligence
6. Encouragement in the trade of agricultural and horticultural produce

As is quite obvious, if we take into consideration the impact of the above mentioned intangible factors on the NPV or IRR of the project, then investment on infrastructure in a rural market becomes a highly profitable proposition. Detailed calculations incorporating various aspects of social cost benefit analysis have not been carried out.

We have considered in this study the financial dimensions of the project and have gathered information relating to financial viability. Ultimate success of the project would depend on how imaginatively the project is managed in all its aspects. In this regard, sound financial management is of great importance.

There are considerable moral and cultural benefits accruing from the investment. Such investment cannot be looked as an instrument merely for solving the problems of poverty and backwardness. The real contribution of the investment is in terms of

enhancing the quality of life of the people in the region. The project would be advantageous from different view points.

Some such non-tangible benefits accruing from investment in the project are detailed below:

1. Markets are held under unhygienic conditions as at present. Food articles, vegetables are kept under exposed conditions and become carriers of diseases and ailments. The project would create healthy and hygienic conditions and thereby the physical well being of the people would be improved.
2. Market is a place of social interaction. It is a venue where people belonging to the region converge for a day or two in a week and buy articles of daily consumption. Improved condition in the market enables people to buy good quality products and thus the quality of life would be improved.
3. Political and social reform activities are conducted through these markets. Improved conditions in the market would attract more and more people to come to the market and derive benefits.
4. Improved conditions in the market could lead to increased business activities and increased arrival of articles of consumption. More business transactions would be carried out through the market and consequently more employment as well as income generation opportunities would be opened up.
5. Consciousness about new products and technology, etc. would be spread through the market. This would lead to improvement in the living standards of people.

Companies can launch new products and processes suited for local consumption through these markets.

6. Climatic conditions reach extreme level during summer, winter and rainy seasons. Conditions become extremely bad particularly during the rainy season and the arrivals of articles is adversely affected. During summer also, when temperature level reaches high, it becomes very difficult both for the traders as well as the customers to visit the market. During winter season also, chilly winds prevent customers and traders to visit the market. Improved conditions would increase the number of days during which the markets are held.
7. When markets are not held regularly or when customers do not arrive in adequate numbers, agricultural produce particularly the perishable vegetables get spoiled or they have to be sold at low price resulting into loss for the producers as well as consumers. Poor and vulnerable sections of the society are particularly harmed on account of poor conditions in the market.
8. Improvement in the market would lead to increased economic activity in the region. It would lead to more efficient and effective utilization of the natural as well as man-power resources available in the region.
9. Cultural activities would be encouraged through improved working conditions. Social welfare and reform activities can also be carried out more easily by improving the conditions in the market.

In a nutshell, the conditions in the market indicate the level of development of civilization. The investment under consideration is a contribution towards civilizational development and thus carries within it several non-financial and non-economic benefits.

If these are taken into consideration, the true value of NPV and IRR is much higher than has been computed in the study. This is shown in the table below. Here we have added an amount equal to 10% of the incremental trading caused due to generation of infrastructural facilities in the market. Savings caused due to reduction in spoilage @ 2% of the additional trading have also been added.

Table 21 : Computation of NPV and IRR on the basis of Economic Analysis

Cash Flow on the basis of Financial Analysis	Benefits of Increase in Trading	Benefit due to Reduction in Spoilage	Total Cash Flow
82140	38559	7712	128411
93912	40487	8097	142497
97545	42512	8502	148559
111970	44637	8927	165534
127929	46869	9374	184172
145582	49213	9843	204637
146301	51673	10335	208309
167880	54257	10851	232988
191729	56970	11394	260093
218081	59818	11964	289863
247193	62809	12562	322564
279345	65950	13190	358485
314850	69247	13849	397946
636048	72709	14542	723299
NPV = 351754; IRR = 16.471%			

WORDS OF CAUTION

Financial viability of the project depends primarily on :

- (1) Surplus of Revenue over expenses (Net Cash Flow); and
- (2) The cost of capital.

In the Table 22 given below, we have calculated the requirements of net cash flow based on different life spans of the project ranging between 15 to 40 years and on the basis of cost of capital ranging between 5% to 18% per annum for an initial investment of Rs.925000 on the infrastructural facilities in the market. The results are quite revealing in the same that if the market fails to generate a minimum revenue as given in the table, the investment would not be financially viable proposition.

Table 22 : Table Giving Equivalent Annual Cost for Different Life Span of the Project at Different Costs of Capital

Cost of Capital (k)	Life of Project (n) (in Years)						
	15	20	25	30	35	40	
0.05	90562	75428	66695	61148	57407	54781	
0.06	96785	81953	73533	68290	64835	62474	
0.08	109820	95741	88058	83498	80655	78829	
0.10	123585	110412	103558	99714	97468	96124	
0.12	138015	125846	119850	116695	114978	114025	
0.15	160756	150176	145417	143162	142067	141528	
0.16	168596	158547	154172	152173	151239	150798	
0.18	184619	175611	171944	170388	169717	169426	

APPENDIX

MATHEMATICAL APPROACH INVOLVED IN THE APPRAISAL OF INVESTMENT ON INFRASTRUCTURE IN A RURAL MARKET

Let the initial investment on the development of infrastructural and public utilities in a market be Rs. 1. It takes about one year to complete the construction of the facilities and these are available for use after a period of one year since construction commences. It is assumed that incremental expenditure on maintenance of the facilities is incurred all at the end of every year and commences from the end of 2 years since construction starts. This same logic holds for incremental revenues also. The gap between incremental revenues and incremental expenditures (i.e. surplus of revenues over expenditures) is assumed to be Rs.X in the beginning (i.e. at the end of 2 years since construction etc. starts) and this increases in real term, @ g per annum. Useful life span of the initial investment is taken to be 14 years with an assumed depreciation @ 5% per annum simple, so that the terminal value of the infrastructural facilities created in the first year would remain to be 30% of the initial investment 1. Cost of capital is assumed to be 'k' per annum.

Based on the above logic,

$$I = \frac{X \cdot \frac{1+g}{1+k}^{14} - 1}{(1+k)(g-k) [(1+k)^{15} - 0.30]} X, \quad \text{and}$$

$$X = \frac{[(1+k)^{15} - 0.30] (1+k)(g-k)}{[(1+k)^{15} \left(\frac{(1+g)^{14}}{(1+k)^{14}} - 1 \right)]} I$$

If k and g are assumed to be 12% and 10% respectively, the above expression becomes

$$I = 10.53 \cdot X \cdot (Bx), \text{ or equivalently}$$

$$X = 0.095 \cdot I \quad (C \cdot I)$$

If cost of capital (k) ranges between 6% to 15% and the growth in surplus (g) ranges between 5% to 20%, the following matrix giving the values of the coefficients involved in the above expression $X = .095 \cdot I$ is generated.

Table 23: Table giving the values of 'C' in the expression $X = C \cdot I$, at different rates of cost of capital and rates of growth

	$k = \text{Cost of capital}$						
	0.0600	0.0800	0.1000	0.1200	0.1400	0.1500	
$g = \text{rate of growth in surplus of revenues over expenditures}$	0.0500	0.0746	0.0900	0.1067	0.1246	0.1437	0.1538
	0.0600	NA	0.0849	0.1009	0.1182	0.1367	0.1465
	0.0800	0.0620	NA	0.0901	0.1061	0.1234	0.1326
	0.1000	0.0546	0.0668	NA	0.0950	0.1110	0.1195
	0.1200	0.0479	0.0589	0.0712	NA	0.0995	0.1074
	0.1400	0.0419	0.0518	0.0629	0.0753	NA	0.0962
	0.1500	0.0392	0.0486	0.0591	0.0709	0.0840	NA
	0.2000	0.0277	0.0348	0.0429	0.0520	0.0624	0.0680

($X = \text{Surplus of revenue over expenditure required to be generated at the end of year 2}$, $I = \text{Initial capital outlay}$, $C = \text{Coefficient values computed on the basis of the assumptions stated in the model}$)

The above table acts as a ready reckoner to ascertain the amount of surplus of revenues over expenditures required to be generated on annual basis with a constant annual growth rate of 'g' and a given cost of capital 'k' in order to justify (on the grounds of financial viability) the initial investment of Rs.1 in a market. As an example, if initial capital outlay on a market is Rs.10 lakhs, then $.095 \times \text{Rs.}1000000 = \text{Rs.}95000$ is the annual surplus of revenues over expenditures which is required to be generated at the end of the initial year (i.e. year 2) in which facilities are made available for use. This should grow annually @ 10% per annum ($g=.10$) in order to make the project viable from financial point of view.

Reciprocals of the values given in the table 21 above, gives the values of B in the expression $I = BX$. Results are as follows:

Table 24: Table giving the values of 'B' in the expression $I = BX$ at different rates of cost of capital and rates of growth

g = rate of growth in surplus of revenues over expenditure	$k = \text{Cost of capital}$						
	0.06	0.08	0.10	0.12	0.14	0.15	
0.05	13.40	11.11	9.38	8.03	6.96	6.50	
0.06	NA	11.77	9.91	8.46	7.31	6.83	
0.08	16.13	NA	11.09	9.42	8.10	7.54	
0.10	18.32	14.98	NA	10.53	9.01	8.37	
0.12	20.88	16.97	14.05	NA	10.05	9.31	
0.14	23.85	19.29	15.89	13.28	NA	10.39	
0.15	25.52	20.58	16.91	14.10	11.91	NA	
0.20	36.04	28.73	23.32	19.21	16.03	14.71	

The above table acts as a ready reckoner to ascertain the maximum amount of capital investment, which should be made on the expectation of a given amount of surpluses of revenues over expenditures. As an example, if it is expected that a surplus of Rs.95000 can be generated in the initial year, then the investment will remain financially viable upto a maximum investment of $Rs.10.53 \times 95000 = Rs.10$ lakhs. An initial investment of an amount less than Rs.10 lakhs, which can generate a surplus of at least Rs.95000 in the initial year, is of course, a good investment proposition. The above result is true for a cost of capital 12% and the annual growth of surplus of revenues over expenditure @ 10% per annum. Other values given in the table are interpreted similarly.

**PATTI NARVAR
RURAL MARKET**

BLOCK MURATGANJ

DISTRICT KAUSHAMBI

I. LOCATION OF THE PATTI NARVAR MARKET

Patti Narvar rural market is held in the Gram Sabha of Patti Narvar, block Mooratganj, District Kaushambi. It is a bi-weekly market held on Wednesday and Saturday. One will have to travel upto 35 kms. towards Imamganj from Allahabad Railway Station and thereafter 4 kms. towards Devara village on Mooratganj-Badanpur link road. Thus, the market is located on Mooratganj-Badanpur link road connecting GT Road.

The market is not old, however, it appears to have tremendous growth potential of marketing for local agricultural produce particularly vegetables and fruits. The market is being held in the primary school premise and the roadsides. The Gram Panchayat claims its ownership over the market. At its present site, any sort of improvement is not possible. The Gram Panchayat has proposed a new site for the development of market which is spacious and adjacent to the existing market. The hinterland of this market is large enough comprising of following twenty (20) villages. The distance of these villages from the market indicates that the hinterland extends to around 9 kms. of market radius. The farmers/traders of the following villages come in this market for sale/purchase of different commodities.

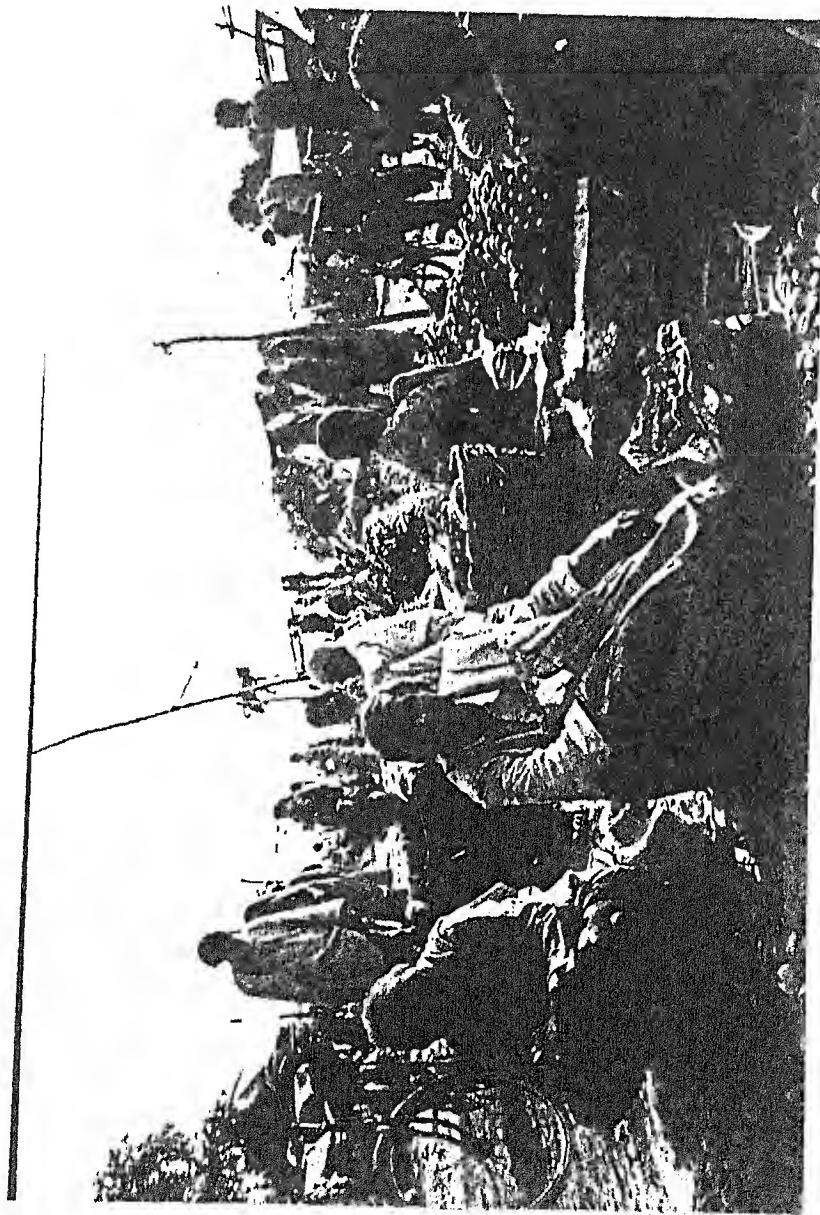
Sl.No.	Name of the Village	Distance from the Market (in Kms.)
1.	Badanpur	1.00
2.	Naraur	1.00
3.	Purva	1.00
4.	Devara	0.00
5.	Baseri	2.00
6.	Subhana	2.00
7.	Nasirpur	1.00
8.	Gausari	2.00

9.	Chabilava	5.00
10.	Bantariya	2.00
11.	Alamchand	1.50
12.	Harrayapur	2.00
13.	Mooratganj	7.00
14.	Kasiya	9.00
15.	Mohiddinpur	6.00
16.	Korai	7.00
17.	Aadampur	5.00
	GANGAPAR VILLAGES	
18.	Lalganj	8.00
19.	Bihar	19.00
20.	Mansoorabad	13.00

II. STRUCTURE OF THE MARKET

The enumeration of shops on a market day in Patti Narvar market by our research team has revealed that around 97 shops of different commodities are there. Among these total shops, vegetables are sold by 70 shops followed by small number of shops of other commodities as shown in Table-1.

In the total market structure, shops owned by females are 8, which are mainly vegetable shops (6). Thus, the Patti Narvar market is mainly the market of vegetables.



Vegetable Selling at Palle narvar Rural market
of District KAU SHAM BI

Table-1 : Structure of the Patti Narvar Market

Commodities	Total Shops			Percentage of Total Shops		
	Male	Female	Total	Male	Female	Total
Vegetables	64(91.43)	6(8.57)	70(100.0)	71.91	75.00	72.16
Foodgrains	5(100.0)	--	5(100.0)	5.62	--	5.15
Gur	8(100.0)	--	8(100.0)	8.99	--	8.25
Fruits	5(83.33)	1(16.67)	6(100.0)	5.62	12.50	6.19
Masala	2(66.67)	1(33.33)	3(100.0)	2.25	12.50	3.09
Fish, Meat	3(100.0)	--	3(100.0)	3.37	--	3.09
Small eatables	2(100.0)	--	2(100.0)	2.25	--	2.06
Total	89(91.75)	8(8.25)	97(100.0)	100.00	100.00	100.0

Note : Figures in brackets indicate percentage.

Source : Based on field data.

III. SAMPLE OF THE MARKET

It was found in the enumeration that there are total 97 shops in Patti Narvar market on any market day. Out of these shops, 66 shops were selected as sample for indepth study. The percentage of sample shops comes to around 74 per cent. The sample also included 3 female shops owners who were selected to give representation to females in the study. Since vegetable shops are largest in the market, therefore 52 vegetable shops have been included in the sample. In Table 1.1 the sample structure of study has been shown.

Table-1.1 : Sample of the Market

Commodities	Selected Sample Shops			Percentage of Sample Shops in Total Shops		
	Male	Female	Total	Male	Female	Total
Vegetables	49(94.23)	3(5.77)	52(100.0)	76.56	50.00	74.29
Foodgrains	4(100.0)	--	4(100.0)	80.00	--	80.00
Gur	6(100.0)	--	6(100.0)	75.00	--	75.00
Fruits	4(100.0)	--	4(100.0)	80.00	--	66.67
Total	63(95.45)	3 (4.55)	66(100.0)	76.83	42.86	74.16

Note : Figures In brackets indicate percentage.

Source : Based on field data.

IV. COMPOSITION OF THE MARKET

The Table-2 reveals that the farmers as well as traders bring different commodities for sale in the market. On any of the two market days in a week, i.e. Wednesday and Saturday, it has been estimated that there are around 61 per cent farmers and 39 per cent traders. It reflects from table that agricultural commodities particularly the vegetables are the main items of sale in the market.

Table-2: Farmers and Traders Composition in the Patti Narvar Market

Commodities	Farmers	Traders	Total
Vegetables	57 (81.43)	13 (18.57)	70 (100.00)
Foodgrains	1 (20.00)	4 (80.00)	5 (100.00)
Gur	--	8 (100.00)	8 (100.00)
Fruits	1 (16.67)	5 (83.33)	6 (100.00)
Masala	--	3 (100.00)	3 (100.00)
Fish, Meat	--	3 (100.00)	3 (100.00)
Small eatables	--	2 (100.00)	2 (100.00)
Total	59 (62.11)	38 (37.89)	97 (100.00)

Note : Figures in brackets indicate percentage.

Source : Based on field data.

V. COMPOSITION OF THE SAMPLE

Keeping in view the composition of farmers and traders in the structure of this market, more than half i.e. 67 per cent farmers and 33 per cent traders have been included in the sample of study. In case of vegetables, foodgrains and fruits, 81 per cent, 25 per cent and 25 per cent farmers have been in the sample respectively. The sample of traders has been drawn from gur and fruits only. In Table-3, farmers and traders composition in the sample has been presented.

Table-3: Farmers and Traders Composition in the Sample of Patti Narvar Market

Commodities	Farmers	Traders	Total
Vegetables	42 (80.77)	10 (19.23)	52 (100.00)
Foodgrains	1 (25.00)	3 (75.00)	4 (100.00)
Gur	--	6 (100.00)	6 (100.00)
Fruits	1 (25.00)	3 (75.00)	4 (100.00)
Total	44 (66.67)	22 (33.33)	66 (100.00)

Note : Figures in brackets indicate percentage.

Source : Based on field data.

VI. TURN OVER OF AGRICULTURAL PRODUCE IN PATTI NARVAR MARKET

The Patti Narvar market is mainly the market of vegetables. The data collected from the sample shops shows that on an average, 61 kgs. of vegetables, 175 kgs. of foodgrains, 37 kgs. of gur, 29 kgs. of fruits and 64 kgs. of all agricultural

produce are sold per shop per market day. On this basis, the total quantity sold by all shops on a market day comes to 4293 kgs., 875 kgs., 293 kgs. and 176 kgs. of vegetables, foodgrains, gur and fruits respectively. The total sale of all agricultural items comes to 5699 kgs. per market day as evident in Table-4.

Table-4: Actual Turn Over of Agricultural Produce of Patti Narvar Market

Commodities	No. of Shops in the Sample	Total Qty. Sold per Market Day by Sample Shops (Kg.)	Average Qty. sold by sample shops per market day (Kg.)	No. of Total shops in the market	Total Qty. sold by all shops per market day (Kg.)
Vegetables	52	3189	61.33	70	4293.10
Foodgrains	4	700	175.00	5	875.00
Gur	6	220	36.67	8	293.36
Fruits	4	117	29.25	6	175.50
All Agricultural Produce	66	4226	64.03	89	5698.67

Source : Based on field data

One of the conditions of selection of rural market for the feasibility study is that the selected market should have annual turn over of more than 1000 MT of agricultural produce. This pre-condition of market selection is not satisfied in case of the Patti Narvar market because our estimate as shown in Table-5, which is based on primary data collected from the sample farmers/traders selling their produce in this market indicated that this market has annual turn over of 593 MT only which is less than the prescribed level of 1000 MT. It has appeared so because the existence of market is not old and infrastructural facilities are absent. Our discussion with the farmers/traders of market indicated that turn over will experience remarkable growth once improved

infrastructural facilities are provided in this market. It is estimated that during the first year after market improvement, the turnover of all agricultural commodities will cross over the level of 1000 MT as the analysis carried out further shows.

Table-5 : Annual Turn Over of All Agricultural Produce in the Patti Narvar Market

Commodities	Turn Over (MT)
Vegetables	446.48
Foodgrains	91.00
Gur	30.51
Fruits	18.25
All Agricultural Produce	592.66

Source : Based on field data.

VII. PERSONS INVOLVED IN BUYING AND SELLING

According to the analysis carried in Table-6, it is evident that on average one person is found to be involved in selling. The situation is generally the same across different commodity groups. It is further evident in Table-6 that on an average 22 persons are found to be purchasing from each shop of the market. On this basis, 2154 persons purchase from all shops on a market day. It can safely be assumed that a person visiting local rural market makes purchase of multiple items. Since the structure of Patti Narvar market consists of seven commodity groups, it is assumed that any person visiting the market on a market day will purchase at least five commodities. On the basis of this assumption, which is also based on our observation and discussion with

the buyers, it comes out that roughly 500 plus persons (both buyers and sellers) come to this market on any market day.

Table-6: Total and Average Number of Persons Involved in Selling and Buying Per Market Day in Patti Narvar Market

Commodities	No. of Persons Involved in Selling	Average No. of Persons Involved in Selling	Total No. of Persons Involved in Buying	Average No. of Persons Involved in Buying (No.)
Vegetables	77	1.10	1579	23
Foodgrains	8	1.50	113	23
Gur	8	1.00	173	22
Fruits	6	1.00	113	19
Masala	3	1.00	90	30
Fish, Meat	3	1.00	48	16
Small eatables	2	1.00	38	19
Total	107	1.10	2154	22

Source : Based on field data.

VIII. REVENUE POTENTIAL OF THE MARKET

At present, the gram panchayat which claims its ownership over the market do not collect any revenue in any form either by way of auction of Tahbazari or direct imposition of market fee. Only a sweeper who does cleaning of the market, collects some meagre money on items sold by farmers/traders. However, it has been assessed that if market fee is imposed at the minimum rate of Re.1/- per shop per market day, how much revenue can be obtained? On this basis, Rs.10,088 per annum can be the revenue available from all the existing shops of the market. The maximum revenue of Rs.7280/- per annum will be available from the vegetable shops followed by Rs.832/- from Gur

shops, Rs.624/- from fruits, Rs.520/- from foodgrains shops and the remaining Rs.832/- from the shops of masala, fish, meat and small eatables as the following Table-7 shows.

Table-7 : Present Potential of Market Fee in Patti Narvar Market

Commodities	Total Shops	Potential Market Fee per Market Day (Rs.)	Potential Market Fee Per Annum (Rs.)
Vegetables	70	70.00	7280.00
Foodgrains	5	5.00	520.00
Gur	8	8.00	832.00
Fruits	6	6.00	624.00
Masala	3	3.00	312.00
Fish, Meat	3	3.00	312.00
Small Eatables	2	2.00	208.00
Total	97	97.00	10,088.00

Source : Based on field data.

IX. MODE OF TRANSPORT USED

The farmers/traders bringing the agricultural produce for sale in Patti Narvar market have been found to be using two types of transport namely cycle and trolley. As evident in Table-8, around 89 per cent of them use cycle as a means to bring the commodities for sale in the market. Only 2 per cent farmers/traders are found to be using trolley. It is also evident that around 9 per cent come to the market on foot. In Table-8, mode of transport used by the farmers/traders of Patti Narvar market has been shown.

Table-8: Farmers/Traders Using Different Mode of Transport to Bring Agricultural Commodities

Commodities	Cycle	Trolleys	On Foot	Total
Vegetables	47 (90.38)	--	5 (9.62)	52 (100.00)
Foodgrains	4 (100.00)	--	--	4 (100.00)
Gur	5 (83.33)	--	1 (16.67)	6 (100.00)
Fruits	3 (75.00)	1 (25.00)	--	4 (100.00)
Total	59(89.39)	1 (1.52)	6 (9.09)	66 (100.00)

Note : Figures given in brackets are percentage.
Source : Based on field data.

X. DISTANCE COVERED TO REACH THE MARKET

The average distance covered by the farmers/traders to reach this market comes to around 4 kms. plus. The distance travelled has been found to be vary across different commodity groups as evident in Table-9. It further reflects that most of the farmers/traders cover the distance upto 5 kms. to reach this market. In case of our sample, around 36 per cent of the farmers/traders have reported to be travelling the distance of 5 kms. and above.

Table-9: Classification of Sample Farmers/Traders According to the Distance Covered to reach the Patti Narvar Market

Commodities	No. of Traders/Farmers						(No.) Average Distance Covered (km.)
	0-1 Km.	1-3 Km.	3-5 Km.	5-8 Km.	8+ Km.	Total	
Vegetables	13 (25.00)	10 (19.23)	12 (23.08)	10 (19.23)	7 (13.46)	52	4.12
Foodgrains	-	1 (25.00)	1 (25.00)	--	2 (50.00)	4	7.25
Gur	-	2 (33.33)	1 (16.67)	1 (16.67)	2 (33.33)	6	6.00
Fruits	1 (50.00)	1 (50.00)	--	2 (50.00)	--	4	3.00
Total	14 (21.21)	14 (21.21)	14 (21.21)	13 (19.70)	11 (16.67)	88	4.41

Note : Figures in brackets indicate percentage

Source : Based on field data.

XI. EXISTING FACILITIES IN THE MARKET

As observed in the market, there is complete lack of infrastructural facilities in the premise of market. Since market is held on road sides near the school premise, there is no space also at the existing site where infrastructure could be provided. The gram panchayat has agreed to provide an alternative piece of land near to the existing market where proposed development would be carried out.

XII. NEED OF IMPROVED FACILITIES

As explained above, Patti Narvar market lacks all marketing infrastructural facilities. Therefore, utmost need is to provide improved facilities because all the sample farmers and traders have expressed their desire to have such facilities as evident from Table-10.

Table-10 : Need of Improved Marketing Facilities in Patti Narvar Market

Commodities	Total No. of Farmers Shop	No. of Farmers Shops requiring improved facilities	No. of farmers willing to pay higher market fee	Total No. of Traders shop	No. of traders shop requiring improved facilities	No. of traders willing to pay higher market fee
Vegetables	42	42(100.00)	42(100.00)	10	10(100.00)	10(100.00)
Foodgrains	1	1(100.00)	1(100.00)	3	3(100.00)	3 (100.00)
Gur	--	--	--	6	6(100.00)	6(100.00)
Fruits	1	1(100.00)	1(100.00)	3	3(100.00)	3(100.00)
Total	44	44	44	22	22	22

Note : Figures in brackets indicate percentage.

Source : Based on field data.

XIII. MARKETING FACILITIES REQUIRED

Since the infrastructural facilities are lacking in Patti Narvar market, the farmers/traders who bring different commodities for sale in this market were encouraged to respond on the basis of PRA that what type of facilities they need? The PRA was done

more rigorously in case of female farmers/traders of the market. The response given by them have been tabulated in Table-11.

It reflects from the table that all farmers/traders of this market require most of the facilities as mentioned in Table-11, but prominent among them are the facilities of place to sit, drinking water, shed, platform, electricity, storage, toilet, cycle stand and drainage. The female farmers/traders want to have drinking water, shed, platform, electricity, toilet, permanent shop and drainage.

Table-11 : Type of Marketing Infrastructural Facilities Required by the Farmers/Traders of Patti Narvar Market

Commodities	Total No. of Farmers/traders	Place	Drinking Water	Shed	Platform	Electricity	Storage	Toilet	Permanent shop	Cycle stand	Proper drainage	Road
Vegetables	52	40 (76.92)	52 (100.00)	52 (100.0)	52 (100.0)	52 (100.0)	30 (57.69)	35 (67.31)	28 (53.85)	49 (94.23)	49 (94.23)	45 (86.54)
Male	49	40 (81.03)	49 (100.00)	49 (100.0)	49 (100.0)	49 (100.0)	30 (61.22)	32 (65.31)	25 (51.02)	49 (100.0)	47 (95.92)	45 (91.84)
Female	3	--	3 (100.00)	3 (100.0)	3 (100.0)	3 (100.0)	--	3 (100.0)	3 (100.0)	--	2 (66.67)	--
Foodgrains	4	2 (50.00)	4 (100.00)	4 (100.0)	4 (100.0)	4 (100.0)	4 (100.0)	2 (50.00)	2 (50.00)	4 (100.0)	3 (75.00)	3 (75.00)
Male	4	2 (50.00)	4 (100.0)	4 (100.0)	4 (100.0)	4 (100.0)	4 (100.0)	2 (50.00)	2 (50.00)	4 (100.0)	3 (75.00)	3 (75.00)
Female	-	--	--	--	--	--	--	--	--	--	--	--
Gur	6	4 (66.67)	6 (100.00)	6 (100.0)	4 (66.67)	6 (100.0)	3 (50.00)	2 (33.33)	2 (33.33)	6 (100.00)	4 (66.67)	5 (83.33)
Male	6	4 (66.67)	6 (100.00)	6 (100.0)	4 (66.67)	6 (100.0)	3 (50.00)	2 (33.33)	2 (33.3)	6 (100.0)	4 (66.67)	5 (83.33)
Female	--	--	--	--	--	--	--	--	--	--	--	--
Fruits	4	2 (50.00)	4 (100.00)	3 (75.00)	3 (75.00)	4 (100.0)	2 (50.00)	1 (25.00)	2 (50.00)	4 (100.00)	3 (75.00)	2 (50.00)
Male	4	2 (50.00)	4 (100.00)	3 (75.00)	3 (75.00)	4 (100.0)	2 (50.00)	1 (25.00)	2 (50.00)	4 (100.0)	3 (75.00)	2 (50.00)
Female	--	--	--	--	--	--	--	--	--	--	--	--
Total	66	48 (72.73)	66 (100.00)	65 (98.48)	63 (95.45)	66 (100.0)	42 (63.64)	40 (60.61)	34 (51.52)	63 (95.45)	59 (89.39)	65 (83.33)
Male	63	48 (76.19)	63 (100.00)	62 (98.41)	60 (95.24)	63 (100.0)	42 (66.67)	37 (56.06)	31 (49.21)	63 (100.0)	57 (90.48)	65 (87.30)
Female	3	--	3 (100.00)	3 (100.0)	3 (100.0)	3 (100.0)	--	3 (100.0)	3 (100.0)	--	2 (66.67)	--

Note : Figures in brackets indicate percentage.
Source : Based on field data.

XIV. EXPECTED INCREASE IN ARRIVALS AFTER MARKET IMPROVEMENT

The above analysis has revealed the fact that (i) market infrastructural facilities are mostly absent in the Patti Narvar market, and (ii) farmers/traders of the market want to have improved facilities by paying market fee. It was attempted to assess that how much increase in turn over of agricultural commodities would result on account of provision of improved facilities in the market. The analysis is important also because the existing turnover of this market is below 1000 MT, which is pre-condition set by UPDASP to select market for feasibility study and hence market development.

The analysis has been carried out in Table-12. It becomes evident that arrivals of all agricultural commodities are expected to go up by 147 per cent and of vegetables by 152 per cent, foodgrains 121 per cent, gur 144 per cent and fruits 184 per cent. This increase in arrival will result on account of increase in present arrival and substantial increase due to entry of new farmers/traders in the market. Thus, it is estimated that the Patti Narvar Market will have annual turnover of 1466 MT of agricultural commodities after its development.

Table-12: Expected Increase in Arrivals of Agricultural Produce After Market Improvement in the Patti Narvar Market

Particulars	Vegetable	Foodgrains	Gur	Fruits	All Agri-cultural Produce
No. of Shops	52	4	6	4	66
Total Qty. Expected to be sold by Sample shops per market day (Kg.)	3877	774	268	166	5085
Average Qty. Expected to be sold by sample shops per market day (kg.)	74.55	193.50	44.67	41.50	77.05
Total No. of shops in the market	70	5	8	6	89
Total Qty. expected to be sold per market day by existion shops (kg.)	5218.50	967.50	357.36	249	6857.45
Expected increase in number of new shops	75	5	8	6	94
Expected turnover of new entrants (kg.)	5591.25	967.50	357.36	249	7242.70
Total expected Increase in turnover per market day (Kg.)	10809.75	1935	714.72	1498	14100.15
Actual Qty. sold per market day (kg.)	4293.10	875	293.36	175.50	5698.67
Percentage increase	151.79	121.14	143.63	183.76	147.43

Source : Based on field data.

Other indirect economic benefits are also involved in the process of efficient marketing system. A transparent and efficient system, as suggested for Patti Narvar market will reduce the interference of middlemen and brokers in the determination of agriculture and other produce prices in the market. This will result into direct benefit to farmers/traders on account of increased prices. This gain may lead to expansion of agricultural activities resulting in higher production in the hinterland of Patti Narvar market.

Erection of marketing infrastructural facilities in Patti Narvar market may provide special benefit in the trading of perishable produce like vegetables, fruits and meat. In case of vegetables, fruits and meats, availability of facilities like water shed, light and storage may reduce at least 20 per cent spoilage of arrivals in the Patti Narvar market.

Data relating to proportion of vegetables in total market turn over has been found to high in Patti Narvar market. It is expected to go higher with the availability of above listed infrastructural facilities. In case of fruits the spoilage rate is found to be over 30 per cent during the peak season in Patti Narvar market.

With the availability of water shed and storage, the spoilage rate under such conditions may go down to less than 20 per cent. In case of meat and fish marketing, the availability of better infrastructural facilities will reduce the spoilage of these produce to a considerable extent. Apart from this, the hygienic conditions will also be maintained with the availability of these facilities in the market. Under the ordinary conditions the spoilage of fruits and meat products is 25 to 35 per cent and it could be reduced to 15 to 10 per cent with the availability of required infrastructural facilities in Patti Narvar market.

XV. EVALUATION OF ECONOMIC BENEFITS EMANATING FROM MARKET IMPROVEMENT IN THE PATTI NARVAR MARKET

Apart from channelising fresh agriculture produce from farm level to final consumers there are other economic benefits which are likely to be generated in the process of market improvements. In fact, these benefits should be considered as an important factor to take up the task of Rural Market Improvement Programmes. There are many economic benefits emanating from improved Rural Market infrastructure. These may broadly be grouped under following categories:

1. As an outcome of market improvements, the volume of turnover will increase. There is possibility that per unit market fee may also go up but this increase may not affect the net gains in view of increased volume of business.
2. Improved efficiency of market operations in the form of better product display, better facilities and availability of more marketing hours for the buyers and sellers resulting in higher per unit price of agricultural produce.
3. Reduction in spoilage of perishable crops; vegetables and fruits with the availability of improved rural marketing infrastructure.
4. It is very logical to put up the idea before a farmer/trader having shop in the market that for availing better market infrastructure they should bear higher market fee. For that matter, the shop owners (traders as well as farmers) have convincingly agreed to pay higher market fee for availing improved market facilities. Besides, additional

market fee would also be realized from the new farmers/traders, who would join the market after its improvement.

For this matter, it was calculated in the financial analysis (Table-16) that much market fee needs to be collected after the improvement of market in order to maintain the market viable. It was found that for the viability of this market, Rs.6.32 per shop per market day need to be collected. If this is taken as a basis of fee collection after the development of Patti Narvar market, a total of Rs.1264.79 per market day need to be collected as shown in the following Table-13.

Table-13 : Potential Market Fee and Increased Market Fee Expected to be paid by Sample Traders/Farmers of Patti Narvar Market

Commodities	No. of Sample Shops at Present	Present Potential Market Fee Collection from Total No. of Shops (Per Market Day)	Expected Total No. of Shops after Market Improvement (No.)	Total increased market fee required for market improvement (Per Market Day) (Rs.)
Vegetables	70	70	145	916.97
Foodgrains	5	5	10	63.24
Gur	8	8	16	101.18
Fruits	6	6	12	75.89
Masala	3	3	6	37.94
Fish and Meat	3	3	7	44.27
Small eatables	2	2	4	25.30
Total	97	97	200	1264.79

Source : Based on field data.

The table shows that the present fee potential of the market can be estimated to be Rs.97/- per market day on the basis of levying a minimum amount of Re.1/- per shop per market day. The expected increase in the number of shops is estimated to be 200

after market development and on viability consideration, Rs.6.32 per shop per market day is to be collected. The farmers/traders, in the course of discussion, have also expressed their view to pay this much of market fee after the development of the market at new site.

However, due to the payment of Rs.6.32 per shop per market day, the per unit market cost of the commodities sold in the new market by the farmers/traders would increase by 300 per cent. The present estimated per unit market cost of the commodities sold in Patti Narvar comes to Re.0.02 which will go upto Re.0.08 after market improvement as shown in Table-14.

Table-14 : Change in Marketing Cost Before and After Market Improvement

Commodities	Present Market Turn Over of Sample Shops (Per Market Day) (Kg.)	Total Fee Potential of Sample Shops (Per Market Day) (Rs.)	Expected Market Turn- over after market improvement in sample shops (Kg.)	Total Expected Collection as Market Fee from Sample Shops (Rs.)	Percentage Increase in Fee Collection after Market Improvement (Rs.)	% Increase in Per Unit Marketing Cost (Rs.)
Vegetables	3189	52(0.02)	3877	328.84(0.08)	532.38	300.00
Foodgrains	700	5(0.01)	774	25.30(0.03)	532.50	200.00
Gur	220	6(0.03)	268	37.94(0.14)	532.33	366.67
Fruits	117	4(0.03)	166	25.30(0.15)	532.50	400.00
All Agricul- tural Produce	4226	66(0.02)	5085	417.38(0.08)	532.39	300.00

Note : Figures in bracket show per unit marketing cost.

Source : Based on field data

Thus, it becomes evident that after the development of Patti Narvar market, the volume of turnover of farmers/traders would be increased and the per unit cost of sale

would also go up. But the increase is not significant in view of increase in the volume of trade after market development.

As a result of improved marketing facilities and infrastructure in the Patti Narvar market, farmers/traders are expected to maintain the quality of their produce to be sold in the market. In other words, they will be able to bring their produce in the market in a more presentable manner. Buyers will also feel more satisfied while purchasing the commodities under improved conditions. Under this situation, sellers of the produce may well justify at least 5 per cent increase in the prices of their produce. As there will be not much increase in per unit marketing cost, this hike in price would be a net gain to the sellers of the agricultural produce in new market as estimated in Table-15.

Table-15 : Estimation of Net Gain in Marketing Under Market Improvement

Commodities	Estimated Total Value of Commodities sold per market at present (Rs.)	Estimated value of commodities to be sold per market day after market improvements (at current prices) (Rs.)	Estimated value of commodities to be sold after market improvement at 5% higher prices	Net gain per market day (Rs.)	Net gain per annum (Approx.) (Rs.)
Vegetables	10732.75	27024.38	28375.60	1351.22	140526.88
Foodgrains	6562.50	14512.50	15238.13	725.63	75465.52
Gur	2640.24	6432.48	6754.10	321.62	33448.48
Fruits	1930.50	16478.00	17301.90	823.90	85685.60
All Agricultural produce	21865.99	64447.36	67669.73	3222.37	335126.48

Source : Based on field data.

XVI. FINANCIAL AND ECONOMIC APPRAISAL OF INVESTMENT IN RURAL MARKET OF PATTI NARVAR

Introduction

Rural markets are a hub-centre of socio-economic activities in a region. Along with public services such as Primary Health Centre, Veterinary Hospital, Post Office, Bank, Educational Institutions, Play Ground, PCO, Police Station, etc., they provide a fillip to the tempo of social, cultural and economic growth of the region comprising of a number of villages from where buyers and sellers of goods and services are attracted to these markets.

Existing conditions in some such markets are far from satisfactory. A typical market may consist of stalls of a temporary nature and sellers sit on ground and on chabutras of houses and shops, open to sky without any shed or cover. Quite often they are held once, twice or thrice a week during the afternoon hours. Some may be the daily markets also.

The products traded in such markets include vegetables, fruits, flowers, edible oil, spices, jaggery, festival goods and services, foodgrains, meat, fish, ready made wears, chappals, sweets, chhats, general goods and services of cobblers, smiths, barbers, etc. Arrival of commodities in the market fluctuates, depending upon the season and other factors.

Catchment area of such rural markets comprises of a large number of smaller and big villages in the vicinity of the village in which the market is held. Total catchment

area of such markets may cover a distance of some 6-8 kms. comprising of 10-15 villages or even more.

The following are some of the important infrastructure and public utilities usually required in such markets:

- (1) Pucca open platforms
- (2) Shaded platforms
- (3) Pucca Shops
- (4) Space for Market Information Centre and Office for Market Management Committee
- (5) Room for Security Guard
- (6) Place for parking of cycles, scooters, buggies, horse-carts, tractor-trolleys, etc.
- (7) Storage facility
- (8) Electrlfication
- (9) Drainage facility
- (10) Boundary wall and Fencing around the haat area with the gates
- (11) Construction of Roads
- (12) Cattle Shed with drinking water facilities
- (13) Drinking wager
- (14) Toilets
- (15) Place for waste disposal
- (16) Plantation of trees

Management of the Market

Quite often the rural market is managed by the Gram Panchayat which realizes 'Tehbazari' from the traders. Another alternative arrangement is that the contract is awarded to a contractor for a stipulated amount per period and the contractor collects Tehbazari from the shopkeepers at predetermined rates. Gram Panchayat may form a "Market Management Committee" (MMC) to monitor the various activities of the market. The committee may take decisions on the mode of maintenance, management, rate of Tehbazari, method of its realization and settlement of disputes related to the market.

Construction of a market with covered and open pucca platforms, fencing around the area and facilities for storage, toilets, water supply, proper drainage and parking, etc. can bring about an improvement in the conditions in such rural markets. Shopkeepers are willing to pay the 'Tehbazari' at higher rates provided proper facilities are developed.

Financial Analysis of Investment in Infrastructure

Initial investment is required on land and on capital cost involved in the creation of infrastructural facilities described above. Land for rural market could be the land owned by the Gram Panchayat, so that no investment is required to be made on this count.

Upkeep of the infrastructure is a must for the sustainability and trouble-free services. Below we provide estimates of expenditure (both capital and revenue type) required to be made in Patti Narvar market located in Mooratganj Block of Allahabad District, for which this feasibility study is being carried out (For details of the mathematical approach involved in this, see the Appendix given at the end).

XVII. FINANCIAL ANALYSIS OF PROPOSED INVESTMENT IN PATTI NARVAR MARKET

Here we evaluate financial viability for providing facilities for the improvement of infrastructural facilities and other amenities in the rural market of Patti Narvar. Parameters involved in the financial analysis are detailed below:

1. Initial Capital Investment

Since the Patti Narvar market, at present, lacks infrastructural facilities therefore substantial amount will have to be spent on the modernisation of the market. Platform/sheds need to be constructed, water supply is to be arranged and other infrastructural facilities are to be provided. All this would require capital expenditure. According to our estimate, Rs.9,15,000/- would be needed as initial capital, which will have to be spent over a time span of one year. This may be termed as initial capital investment. We also assume that the entire capital investment will be made instantaneously at the beginning of the year. This is not an unrealistic assumption.

2. Life Span of the Project

The market infrastructural facilities proposed to be provided in the Patti Narvar market would have usefulness for a fairly long period of time though depreciation is bound to take place with the passage of time. The actual life span of the project cannot be estimated with high degree of accuracy but on the basis of technical opinion of the Architect/Civil Engineer, it is assumed that the facilities proposed to be provided would

last for a period of at least 15 years. It may not be unrealistic to assume that the facilities provided would remain useful even for a period of 20 years and above. In case of Patti Narvar market we have taken the life span of the project to be 15 years. Thus, scrap value of the initial infrastructural facilities created at a cost of Rs.9,15,000 has been treated as 30% of the initial capital cost, i.e. Rs.2,47,050.

3. Cost of the Capital

Cost of the capital for project is a critical factor which determines the viability of project. Cost of capital based on the competitive interest rates prevailing in the market would be too high if considered for this market. For socially desirable activities, it is even worthwhile to examine the financial viability at a relatively lower cost of capital. In practice also, the agencies involved in financing socially desirable activities encourage development of infrastructural facilities at a lower rate of capital cost. The projects so financed have plethora of social benefits, apart from financial benefits emanating from the project financed.

Keeping all this in view, 12 per cent annual cost of capital has been considered in the financial analysis of the Patti Narvar Market.

4. Cost of Repair and Maintenance

The proposed facilities to be provided in the market are bound to depreciate over the passage of time. Proper maintenance and upkeep of facilities in good condition is a social as well as economic necessity.

Keeping this objective in view, adequate provision has been made to account for the cost likely to arise on account of repair and maintenance. Items of expenditure under this head are as follows:

- (a) Expenditure on labour, materials and overheads for repair and maintenance of facilities;
- (b) Repair/Replacement of water pumps, electrical equipments and accessories etc. from time to time;
- (c) Salaries and wages payable to persons employed for the upkeep of facilities created by the project.

Details of annual maintenance expenditure are as follows:

1.	Watchman for Security @ Rs.1500 per month	Rs.18,000
2.	Sweeper for cleaning for 104 days @ Rs.40 per day	Rs. 4,160
3.	Electrical Maintenance for 104 days @ Rs.100 per day	Rs.10,400
4.	Maintenance of Handpump	Rs. 1,000
<hr/>		
Total		Rs.33,560
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The above expenditure is expected to increase @ 5% annually.

Technical estimates suggest that there would be zero expenditure on repair and maintenance of the project during the first year. It is assumed that during second and third years, 2 per cent of the initial investment would be required for repair and maintenance. During the years 4 to 7, this will be 3% of the initial investment and

thereafter @ 5 per cent of the initial capital investment will be needed for repair and maintenance of civil work and other infrastructural facilities till 15th year.

5. Revenues Arising from the Market

The completion of the market improvement programme would result into substantial improvement in the working conditions of the Patti Narvar market. Farmers and traders would get a sizeable and respectable place to sit in and transact the business. They would be saved from the inconvenience arising due to limited space, open sale and bad weather. There is always a good-will value associated with a good looking shop.

As a result of improved facilities in the market, it is expected that on account of availability of improved facilities the users of market would be willing to pay an increased market fee and rent for using these facilities.

Views of farmers/traders were solicited on the required increase in the market fee recoverable from them after market improvement programme is carried out. Incremental increase in revenue due to creation of infrastructural facilities has been put at Rs.9,15,000 in the initial year. This is expected to go up @ 10% per annum.

NPV (Net Present Value) of Investments in the Projects

Based on the assumptions stated above, the sources of cash inflows and outflows are as follows:

Inflows

- (a) Expected increase in revenue (Beginning at Rs.1,31,536 per annum and going up @ 10% per annum)
- (b) Terminal value of initial investment (after 15 years from now) (30% of initial capital cost)

Outflows

- (c) Initial capital cost (Rs.9,15,000)
- (d) Cost of Repair and Maintenance (Rs.33560 in the initial year and expected to increase @ 5% per annum)
- (e) Cost of maintenance of civil work and other infrastructural facilities (2% of capital cost in years 2 and 3, 3% in years 4 to 7, and 5% from years 8 onwards).

**Table 16: Computation of NPV and IRR on the basis of Expected Cash Flows
(Financial Point of View)**

Year	Addl. Revenue Generated (based on increase @ 10% p.a.)	Terminal Value	Initial Capital Cost	Cost of Repair & Maintenance (based on increase @ 5% p.a.)	Rate of Increase in the Maintenance cost of civil work	Cost of Maintenance of Civil Work (based @ 2% of initial investment in years 2&3 and 5% thereafter)	Net Cash Flow
(1)	(2)	(3)	(4)	(5)	(6)	(7)	
0		915000					(915000)
1							0
2	131536			33560	0.02	18300	79678
3	144692			35238	0.02	18300	91154
4	159161			37000	0.03	27450	94711
5	175077			38850	0.03	27450	108777
6	192585			40792	0.03	27450	124342
7	211843			42832	0.03	27450	141561
8	233028			44974	0.05	45750	142304
9	256330			47222	0.05	45750	163358
10	281964			49583	0.05	45750	186630
11	310160			52063	0.05	45750	212347
12	341176			54666	0.05	45750	240780
13	375293			57399	0.05	45750	272144
14	412823			60269	0.05	45750	306804
15	454105	274050		63282	0.05	45750	619573

NPV = 0; IRR = 12% per annum

Based on a cost of capita of 12%, the NPV of the project is zero. However, with changes in the cost of capital, the NPV of the project is as follows:

Table 17: Impact of Changes in Cost of Capital on Net Present Value

Cost of Capital	NPV (in Rs.)
0.06	614073
0.08	361842
0.10	161100
0.12	--
0.14	(130342)
0.15	(186145)
0.16	(236640)

Additional revenue arising due to the proposed investment on infrastructural facilities is expected to be Rs.1,31,536 per annum in the initial year. However, if this falls short of the expectations, NPV becomes negative. In the tables below, the NPV and IRR are given for different amounts of additional revenue generated in the initial year ranging from Rs.130000 to as high as Rs.180000 along with the rates of growth in the revenues ranging from 5% per annum to 20% per annum.

Table 18 : Table Giving NPV at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)					
	130000	140000	150000	160000	170000	180000
0.05	(322867)	(246991)	(171116)	(95240)	(19364)	56512
0.06	(269690)	(189724)	(109757)	(29791)	50175	130142
0.08	(151464)	(62,404)	26657	115718	204779	293839
0.10	(15309)	84225	183759	283294	382828	482362
0.12	141639	253246	364854	476461	588068	699675
0.14	322688	448222	573756	699290	824824	950358
0.15	423420	556703	689986	823268	956551	1089834
0.20	1051569	1233171	1414773	1596374	1777976	1950578

Table 19 : Table Giving IRR at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)						
			130000	150000	160000	170000	180000
0.05	0.064	0.078	0.092	0.105	0.117	0.129	
0.06	0.075	0.089	0.103	0.115	0.128	0.139	
0.08	0.097	0.111	0.124	0.136	0.148	0.160	
0.10	0.118	0.131	0.144	0.157	0.168	0.180	
0.12	0.138	0.151	0.164	0.176	0.188	0.199	
0.14	0.158	0.171	0.183	0.195	0.207	0.218	
0.15	0.167	0.180	0.193	0.205	0.216	0.227	
0.20	0.213	0.226	0.238	0.250	0.261	0.272	

Accumulations in the Sinking Fund

Surpluses of revenues over expenditure can be used for further expansion of facilities in the market and for providing additional facilities to sellers and buyers. These funds can be invested in safe and profitable investment avenues with a view to get a lump sum amount of money which can be used for replacement of infrastructural facilities when they get decayed and outdated. The deposits in the fund are expected to be as follows, depending upon the rate of interest earned on investments:

Table 20: Table giving accumulated value of Deposits made in the Sinking Fund at Different Rates of Interest, as at the end of 15 years

Rate of Interest	Revenue of the Initial Year (Rs. in Lakh)					
	130000	140000	150000	160000	170000	180000
0.08	39.64	44.14	48.45	52.75	57.05	61.35
0.09	41.95	46.50	51.06	55.62	60.18	64.74
0.10	44.21	49.04	53.67	58.71	63.54	68.37
0.11	46.64	51.77	56.90	62.02	67.15	72.28
0.12	49.25	54.69	60.14	65.59	71.04	76.49
0.13	52.05	57.84	63.63	69.42	75.21	81.00
0.14	55.06	61.22	67.38	73.54	79.70	85.86
0.15	58.30	64.86	71.41	77.97	84.52	91.08

ECONOMIC ANALYSIS

The following intangible benefits of the investment are particularly noteworthy:

- (1) Increase in the value of transactions carried out in the market
- (2) Benefits for women
- (3) Technology dissemination and technology development
- (4) Reduction in spoilage
- (5) Dissemination of market intelligence
- (6) Encouragement in the trade of agricultural and horticultural produce

As is quite obvious, if we take into consideration the impact of the above mentioned intangible factors on the NPV or IRR of the project, then investment on infrastructure in a rural market becomes a highly profitable proposition. Detailed calculations incorporating various aspects of social cost benefit analysis have not been carried out.

We have considered in this study the financial dimensions of the project and have gathered information relating to financial viability. Ultimate success of the project would depend on how imaginatively the project is managed in all its aspects. In this regard, sound financial management is of great importance.

There are considerable moral and cultural benefits accruing from the investment. Such investment cannot be looked as an instrument merely for solving the problems of poverty and backwardness. The real contribution of the investment is in terms of enhancing the quality of life of the people in the region. The project would be advantageous from different view points.

Some such non-tangible benefits accruing from investment in the project are detailed below:

(1) Markets are held under unhygienic conditions as at present. Food articles, vegetables are kept under exposed conditions and become carriers of diseases and ailments. The project would create healthy and hygienic conditions and thereby the physical well being of the people would be improved.

- (2) Market is a place of social interaction. It is a venue where people belonging to the region converge for a day or two in a week and buy articles of daily consumption. Improved condition in the market enables people to buy good quality products and thus the quality of life would be improved.
- (3) Political and social reform activities are conducted through these markets. Improved conditions in the market would attract more and more people to come to the market and derive benefits.
- (4) Improved conditions in the market could lead to increased business activities and increased arrival of articles of consumption. More business transactions would be carried out through the market and consequently more employment as well as income generation opportunities would be opened up.
- (5) Consciousness about new products and technology, etc. would be spread through the market. This would lead to improvement in the living standards of people. Companies can launch new products and processes suited for local consumption through these markets.
- (6) Climatic conditions reach extreme level during summer, winter and rainy seasons. Conditions become extremely bad particularly during the rainy season and the arrivals of articles is adversely affected. During summer also, when temperature level reaches high, it becomes very difficult both for the traders as well as the customers to visit the market. During winter season also, chilly winds prevent customers and traders to visit the market. Improved conditions would increase the number of days during which the markets are held.

- (7) When markets are not held regularly or when customers do not arrive in adequate numbers, agricultural produce particularly the perishable vegetables get spoiled or they have to be sold at low price resulting into loss for the producers as well as consumers. Poor and vulnerable sections of the society are particularly harmed on account of poor conditions in the market.
- (8) Improvement in the market would lead to increased economic activity in the region. It would lead to more efficient and effective utilization of the natural as well as man-power resources available in the region.
- (9) Cultural activities would be encouraged through improved working conditions. Social welfare and reform activities can also be carried out more easily by improving the conditions in the market.

In a nutshell, the conditions in the market indicate the level of development of civilization. The investment under consideration is a contribution towards civilizational development and thus carries within it several non-financial and non-economic benefits.

If these are taken into consideration, the true value of NPV and IRR is much higher than has been computed in the study. This is shown in the table below. Here we have added an amount equal to 10% of the incremental trading caused due to generation of infrastructural facilities in the market. Savings caused due to reduction in spoilage @ 2% of the additional trading have also been added.

Table 21 : Computation of NPV and IRR on the basis of Economic Analysis

Cash Flow on the basis of Financial Analysis	Benefits of Increase in Trading	Benefit due to Reduction in Spoilage	Total Cash Flow
96440	110000	22000	211678
109762	115500	23100	229754
114500	121275	24255	240241
130800	127339	25468	261584
148823	133706	26741	284789
168744	140391	28078	310031
170761	147411	29482	319197
195085	154781	30956	349095
221955	162520	32504	381654
251630	170646	34129	417123
284396	179178	35836	455774
320569	188137	37627	497909
360495	197544	39509	543857
704558	207421	41484	868478
NPV = 1001561; IRR = 23.964%			

WORDS OF CAUTION

Financial viability of the project depends primarily on :

- (1) Surplus of Revenue over expenses (Net Cash Flow); and
- (2) The cost of capital.

In the Table-22, we have calculated the requirements of net cash flow based on different life spans of the project ranging between 15 to 40 years and on the basis of cost of capital ranging between 5% to 18% per annum for an initial investment of Rs.9,15,000 on the infrastructural facilities in the market. The results are quite revealing in the same

that if the market fails to generate a minimum revenue as given in the table, the investment would not be financially viable proposition.

Table 22 : Table Giving Equivalent Annual Cost for Different Life Span of the Project at Different Costs of Capital

Cost of Capital (k)	Life of Project (n) (in Years)						
	15	20	25	30	35	40	
0.05	88153	73422	64921	59522	55881	53325	
0.06	94211	79774	71577	66474	63111	60812	
0.08	106899	93195	85716	81277	78510	76732	
0.10	120299	107476	100804	97063	94876	93567	
0.12	134344	122499	116662	113591	111920	110993	
0.15	156481	146182	141550	139355	138288	137764	
0.16	164112	154330	150072	148125	147215	146788	
0.18	179709	170940	167371	165857	165204	164920	

APPENDIX

MATHEMATICAL APPROACH INVOLVED IN THE APPRAISAL OF INVESTMENT ON INFRASTRUCTURE IN A RURAL MARKET

Let the initial investment on the development of infrastructural and public utilities in a market be Rs. 1. It takes about one year to complete the construction of the facilities and these are available for use after a period of one year since construction commences. It is assumed that incremental expenditure on maintenance of the facilities is incurred all at the end of every year and commences from the end of 2 years since construction starts. This same logic holds for incremental revenues also. The gap between incremental revenues and incremental expenditures (i.e. surplus of revenues over expenditures) is assumed to be Rs.X in the beginning (i.e. at the end of 2 years since construction etc. starts) and this increases in real term, @ g per annum. Useful life span of the initial investment is taken to be 14 years with an assumed depreciation @ 5% per annum simple, so that the terminal value of the infrastructural facilities created in the first year would remain to be 30% of the initial investment 1. Cost of capital is assumed to be 'k' per annum.

Based on the above logic,

$$I = \frac{X}{(1+k)(g-k)} \cdot \frac{1 - (1+k)^{15}}{1 - (1+k)^{14}}$$

X. and

$$X = \frac{[(1+k)^{15} - 0.30] (1+k)(g-k)}{[(1+k)^{15} \left(\frac{(1+g)^{14}}{(1+k)^{14}} - 1 \right)]}$$

If k and g are assumed to be 12% and 10% respectively, the above expression becomes

$$I = 10.53 \cdot X \cdot (Bx), \text{ or equivalently}$$

$$X = 0.095 \cdot I \quad (C.I)$$

If cost of capital (k) ranges between 6% to 15% and the growth in surplus (g) ranges between 5% to 20%, the following matrix giving the values of the coefficients involved in the above expression $X = .095 \cdot I$ is generated.

Table 23: Table giving the values of 'C' in the expression $X = C \cdot I$. at different rates of cost of capital and rates of growth

g = rate of growth in surplus of revenues over expenditures	k = Cost of capital						
	0.0600	0.0800	0.1000	0.1200	0.1400	0.1500	
0.0500	0.0746	0.0900	0.1067	0.1246	0.1437	0.1538	
0.0600	NA	0.0849	0.1009	0.1182	0.1367	0.1465	
0.0800	0.0620	NA	0.0901	0.1061	0.1234	0.1326	
0.1000	0.0546	0.0668	NA	0.0950	0.1110	0.1195	
0.1200	0.0479	0.0589	0.0712	NA	0.0995	0.1074	
0.1400	0.0419	0.0518	0.0629	0.0753	NA	0.0962	
0.1500	0.0392	0.0486	0.0591	0.0709	0.0840	NA	
0.2000	0.0277	0.0348	0.0429	0.0520	0.0624	0.0680	

(X = Surplus of revenue over expenditure required to be generated at the end of year 2, I = Initial capital outlay, C = Coefficient values computed on the basis of the assumptions stated in the model)

The above table acts as a ready reckoner to ascertain the amount of surplus of revenues over expenditures required to be generated on annual basis with a constant annual growth rate of 'g' and a given cost of capital 'k' in order to justify (on the grounds of financial viability) the initial investment of Rs.1 in a market. As an example, if initial capital outlay on a market is Rs.10 lakhs, then .095 X Rs.1000000 = Rs.95000 is the annual surplus of revenues over expenditures which is required to be generated at the end of the initial year (i.e. year 2) in which facilities are made available for use. This should grow annually @ 10% per annum ($g=.10$) in order to make the project viable from financial point of view.

Reciprocals of the values given in the table 21 above, gives the values of B in the expression $I = BX$. Results are as follows:

Table 24: Table giving the values of 'B' in the expression $I = BX$ at different rates of cost of capital and rates of growth

g = rate of growth in surplus of revenues over expenditure	k = Cost of capital					
	0.06	0.08	0.10	0.12	0.14	0.15
0.05	13.40	11.11	9.38	8.03	6.96	6.50
0.06	NA	11.77	9.91	8.46	7.31	6.83
0.08	16.13	NA	11.09	9.42	8.10	7.54
0.10	18.32	14.98	NA	10.53	9.01	8.37
0.12	20.88	16.97	14.05	NA	10.05	9.31
0.14	23.85	19.29	15.89	13.28	NA	10.39
0.15	25.52	20.58	16.91	14.10	11.91	NA
0.20	36.04	28.73	23.32	19.21	16.03	14.71

The above table acts as a ready reckoner to ascertain the maximum amount of capital investment, which should be made on the expectation of a given amount of surpluses of revenues over expenditures. As an example, if it is expected that a surplus of Rs.95000 can be generated in the initial year, then the investment will remain financially viable upto a maximum investment of $Rs.10.53 \times 95000 = Rs.10$ lakhs. An initial investment of an amount less than Rs.10 lakhs, which can generate a surplus of at least Rs.95000 in the initial year, is of course, a good investment proposition. The above result is true for a cost of capital 12% and the annual growth of surplus of revenues over expenditure @ 10% per annum. Other values given in the table are interpreted similarly.

**KAPSA RURAL MARKET
BLOCK PHOOLPUR
DISTRICT ALLAHABAD**

I. LOCATION OF THE KAPSA MARKET

Kapsa rural market is the bi-weekly market, held at the Kapsa village on Monday and Friday of each week. The market is 53 kms. away from Allahabad district headquarter and 9 kms. away from the Phoolpur block. From the Phoolpur block, one has to travel upto 9 kms. on Phoolpur-Mubarakpur road. Thereafter, one will have to take a left turn on link type road, which goes upto Qutubpur. On this road after 4 kms., Kapsa village is located where this market is being held since the last several years. This is old and popular rural market of the area. The market is being held on the sides of the road, owned by the PWD and this too is in a very dilapidated condition. However the road is being improved by the UPDASP. Despite the market being held on the sides of road of PWD, the market is owned by the Gram Panchayats. Whatever revenue is generated by way of annual auction that is being deposited with the Kapsa Gram Panchayat. At its present location, any sort of improvement on provision of market infrastructural facilities is not possible. The Gram Panchayat, therefore, has agreed to provide an alternative site just by the side of the road near to the Kapsa and Jogapur villages. The detailed location of the existing market and alternative site have been depicted in the enclosed map. The hinterland of this market is large enough to be consisting of the following twenty-two (22) villages :

Name of the Villages	Distance from the Market (in Kms.)
1. Rasoolpur	4.00
2. Mohammadpur	6.00
3. Raini	5.00
4. Kudanpura	5.00
5. Rampur	2.00
6. Gajehri	9.00
7. Kusahta	4.00
8. Mariakpura	9.00
9. Jogapur	0.00
10. Kapsa	0.00
11. Mubarakpur	8.00
12. Nevada	5.00
13. Katnai	9.00
14. Singledeep	4.00
15. Sadvapur	6.00
16. Rajjupur	3.00
17. Rajaypur	5.00
18. Mahpura	3.00
19. Atanpur	4.00
20. Dhelahey Pahri	9.00
21. Dhokpoora	7.00
22. Kauri	8.00

II. STRUCTURE OF THE MARKET

The field visits to the market and in-depth discussion with the Kapsa village Pradhan and knowledgeable persons revealed the fact that the structure of Kapsa market consists of around 164 shops of farmers/traders in any market day. Among the total shops of different commodities vegetable shops are largest (109), followed by the foodgrains shops (22), Gur (12), fruits (11) and miscellaneous shops of sweets, meats and bangles (10). The shops owned by the females are 11 per cent in total and 15 per cent of vegetables. The commodity-wise total number of shops of males and females with their percentage shares have been shown in Table-1. The sample selected for the study constitutes around 55 per cent as shown in Table-1.1.

Table-1 : Structure of the Kapsa Market

COMMODITIES	TOTAL SHOPS			PERCENTAGE OF TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	93 (85.32)	16 (14.68)	109 (100.00)	63.70	88.89	66.46
Foodgrains	22 (100.0)	--	22 (100.00)	15.07	--	13.41
Gur	12 (100.0)	--	12 (100.00)	8.22	--	7.32
Fruits	11 (100.0)	--	11 (100.00)	7.53	--	6.71
Sweet	4 (100.0)	--	4 (100.00)	2.74	--	2.44
Meat	4 (100.0)	--	4 (100.00)	2.74	--	2.44
Bangle	00	2 (100.00)	2 (100.00)	--	11.11	1.22
Total	146 (89.02)	18 (10.98)	164 (100.00)	100.00	100.00	100.0

Note : Figures in brackets indicate percentage
Source: Based on field data

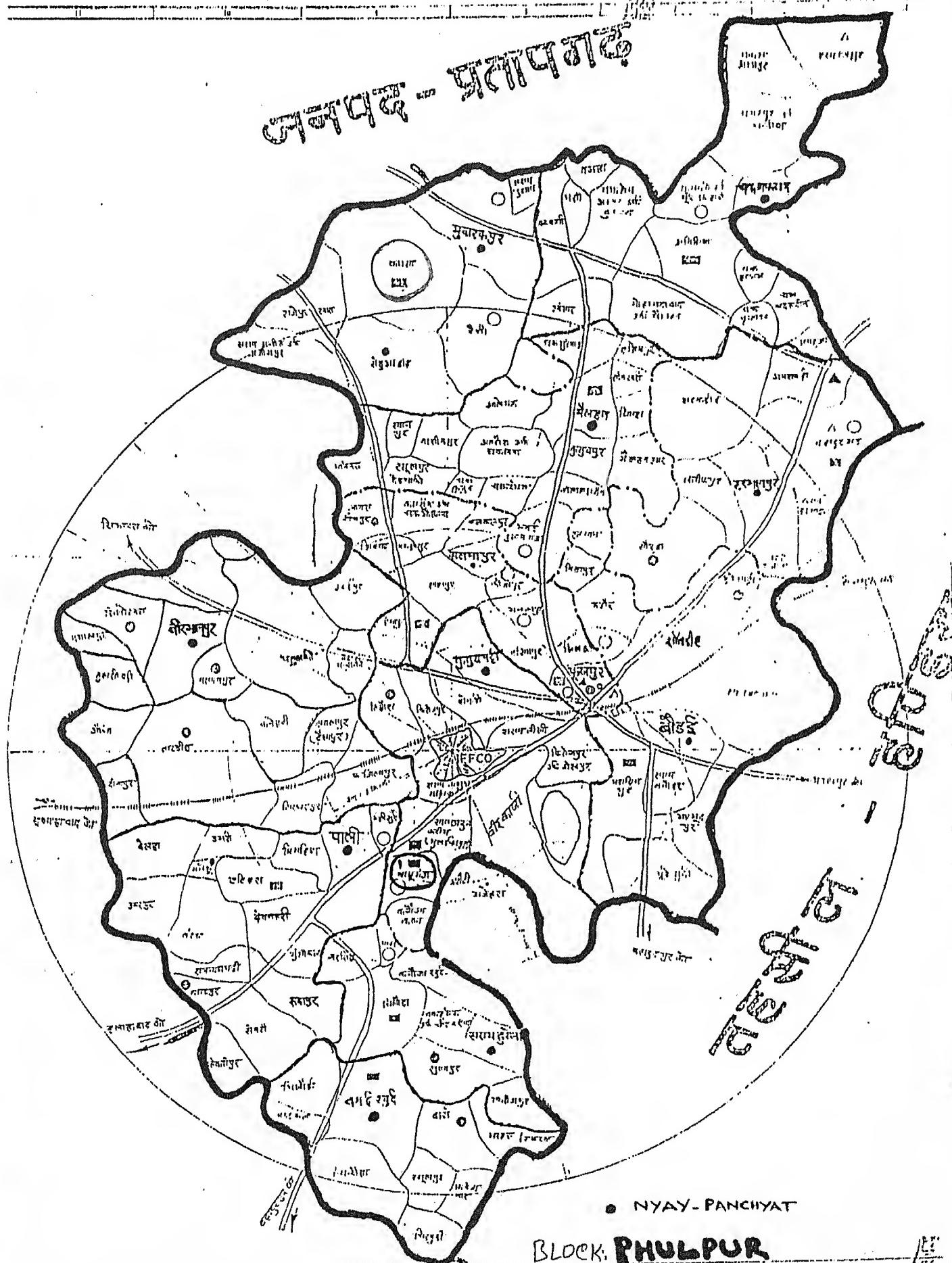


Female Farmer selling vegetable
in LCAPS A Market of Allahabad



Farmers Selling Vegetable at the market
of KAPS A in Allahabad

जनधर्म - प्रतापगढ़



• NYAY-PANCHYAT

BLOCK, PHULPUR

DISTRICT: ALLAHABAD

Table-1.1 : Sample of the Market

COMMODITIES	SELECTED SAMPLE SHOPS			PERCENTAGE OF SAMPLE SHOPS IN TOTAL SHOPS		
	Male	Female	Total	Male	Female	Total
Vegetables	51 (85.00)	9 (15.00)	60 (100.00)	54.84	56.25	55.05
Foodgrains	12 (100.0)	--	12 (100.00)	54.55	--	54.55
Gur	7 (100.0)	--	7 (100.00)	58.33	--	58.33
Fruits	6 (100.0)	--	6 (100.00)	54.55	--	54.55
Sweet	2 (100.0)	--	2 (100.00)	50.00	--	50.00
Meat	2 (100.0)	--	2 (100.00)	50.00	--	50.00
Bangle	00	1 (100.00)	1 (100.00)	--	50.00	50.00
Total	80 (88.89)	10 (11.11)	90 (100.00)	54.79	55.56	54.88

Note : Figures in brackets indicate percentage.

Source: Based on field data.

III. COMPOSITION OF THE MARKET

As evident from Table-2, the farmers and traders brought different commodities for sale in market. In any of the two market days in a week, i.e. on Monday or Friday among all the sellers of commodities, it was estimated that more than half of them were the farmers and less than half were the traders. Of all the vegetable shops, roughly 60 per cent were of farmers and rest 40 per cent of

Table-2: Farmers and Traders Composition in the Kapsa Market

Commodities	Farmers	Traders	Total
Vegetables	65 (59.63)	44 (40.37)	109 (100.00)
Foodgrains	17 (77.27)	5 (22.73)	22 (100.00)
Gur	--	12 (100.00)	12 (100.00)
Fruits	4 (36.36)	7 (63.64)	11 (100.00)
Sweets	--	4 (100.00)	4 (100.00)
Meat	--	4 (100.00)	4 (100.00)
Bangles	--	2 (100.00)	2 (100.00)
Total	86 (52.44)	78 (47.56)	164 (100.00)

Source : Based on field data.

traders. Around 77 per cent farmers brought the foodgrains for sale while 23 per cent foodgrains shops belonged to the traders. Thus in case of agricultural commodities like vegetables and foodgrains, largely the farmers were involved in the selling which indicated the fact that the Kapsa rural markets has three distinct features :

1. The Kapsa market is local agricultural based bi-weekly rural market.
2. It is primarily a market of vegetables.
3. It is primarily a market of local farmers.

IV. COMPOSITION OF THE SAMPLE

Keeping in view the composition of farmers and traders in selling of different commodities, more than half of the total farmers (52 per cent) and less than half of

the total traders (48 per cent) were selected as the sample of study. In case of vegetables, foodgrains and fruits, 60 per cent, 75 per cent and 33 per cent farmers were selected as sample respectively. In case of Gur and other non-agricultural commodities, only traders were selected and interviewed. The Table-3 shows the composition of farmers and traders in the sample of the study.

Table-3: Farmers and Traders Composition in the Sample of Kapsa Market

Commodities	Farmers	Traders	Total
Vegetables	36 (60.00)	24 (40.00)	60 (100.00)
Foodgrains	9 (75.00)	3 (25.00)	12 (100.00)
Gur	--	7 (100.00)	7 (100.00)
Fruits	2 (33.33)	4 (66.67)	6 (100.00)
Sweets	--	2 (100.00)	2 (100.00)
Meat	--	2 (100.00)	2 (100.00)
Bangles	--	1 (100.00)	1 (100.00)
Total	47 (52.22)	43 (47.78)	90 (100.00)

Source : Based on field data.

V. TURN OVER OF AGRICULTURAL PRODUCE IN KAPSA MARKET

The Kapsa rural market is primarily the market of agricultural produce which became evident that out of the total 164 shops involved in sale of different commodities, the share of shops of agricultural commodities came to around 94 per cent. The vegetables commanded major share followed by foodgrains, fruits and

gur. The data collected from the sample shops showed that on an average 56 kgs. of vegetables were sold by each vegetable shop followed by 142 kgs. foodgrains per shop, 61 kgs. fruits per shop and 30 kgs. gur per shop. On this basis, the total quantity sold by all shops per market day came to 6064 kgs., 3124 kgs., 667 kgs. and 360 kgs. in respect of vegetables, foodgrains, fruits and gur respectively as evident in the Table-4.

Table-4: Actual Turn Over of Agricultural Produce of Kapsa Market

Commodities	No. of Shops in the Sample	Total Qty. Sold per Market Day by Sample Shops (Kg.)	Average Qty. sold by sample shops (Kg.)	No. of Total shops in the market	Total Qty. sold by all shops per market day (Kg.)
Vegetables	60	3338	55.63	109	6063.67
Foodgrains	12	1704	142.00	22	3124
Gur	7	210	30.0	12	360
Fruits	6	364	60.67	11	667.37
All Agricultural Produce	85	5616	66.07	154	10174.78

Source : Based on field data

One of the criterions of selection of rural haat/painth for the feasibility study is that the selected market should have turn over of more than 1000 MT per annum of all agricultural commodities. This pre-condition of market selection is justified in case of the Kapsa rural market because our estimate as shown in Table-5 based on primary data collected from the sample farmers/traders selling their commodities

in this market indicated that this market has annual turn over of around 1058 MT of all agricultural commodities. The annual turn over of vegetables has been estimated to be 631 MT followed by 324 MT of foodgrains, 69 MT of fruits and 37 MT of Gur.

Table-5 : Annual Turn Over of All Agricultural Produce in the Kapsa Market

Commodities	Turn Over (MT)
Vegetables	630.62
Foodgrains	324.90
Gur	37.44
Fruits	69.41
All Agricultural Produce	1058.18

Source : Based on field data.

VI. PERSONS INVOLVED IN BUYING AND SELLING

According to our innumeration, there are 164 shops of different commodities per market day in Kapsa market. In all the shops, more than one person remain involved in selling. The average number of persons found to

be involved in selling is found to be more or less same (around one person) in case of agricultural commodities, while in sales of non-agricultural items, average involvement is found to be more (average two persons) as evident from Table-6. It reflects from the table that on an average 26 persons purchased from each shop of the market in one market day. In case of vegetables and foodgrains, 28 persons and 25 persons purchased per shop while in non-agricultural commodities, lesser number of persons purchased from each shop. In total, 4184 persons were estimated to be involved in buying of different commodities per market day which indicated that roughly a total of 600 persons participated in purchasing of different commodities per market day in Kapsa market.

Table-6: Total and Average Number of Persons Involved in Selling Per Market Day and Buying in Kapsa Market

Commodities	No. of Persons Involved in Selling	Average No. of Persons Involved in Selling	Total No. of Persons Involved in Buying	Average No. of Persons Involved in Buying (No.)
Vegetables	117	1.07	3052	28
Foodgrains	29	1.34	550	25
Gur	12	1.00	204	17
Fruits	11	1.00	198	18
Sweets	6	1.50	92	23
Meat	8	2.00	48	12
Bangles	4	2.00	40	20
Total	187	1.14	4184	26

Source : Based on field data.

VII. MARKET FEES, REVENUE OBTAINED AND ITS POTENTIAL

It was reported by the farmers/traders of Kapsa market that they pay Re.1 to Rs.1.50 per shop per market day as market fee to a person who has paid Rs.5152/- to Kapsa Gram Panchayat for collecting market fee in the auction for this year only. Though he has paid Rs.5152/- as lumpsum. However, on the basis of rate of market fee of Re.1 to Rs.1.50 per shop per market day, he collects Rs.17982/- per annum. In this way, Kapsa Gram Panchayat has got only 29 per cent of the existing potential of the market fee as become evident from Table-7.

Table-7 : Present Rate of Market Fee, Revenue Obtained from Market Fees and Present Potential Revenue per annum of Kapsa Market

Commodities	Rate of Market Fee at Present	Revenue Obtained from Market Fee per annum at Present	Potential Revenue from Market Fee Per Annum at Present	(Rs.) Gap Between Present and Potential Revenue Per Annum at Present
Vegetables	1.02	3423	11563	8140
Foodgrains	1.13	691	2585	1894
Gur	1.00	377	1248	871
Fruits	1.16	346	1338	992
Sweets	1.50	126	624	498
Meat	1.00	126	416	290
Bangles	1.00	63	208	145
Total	1.05	5152	17982	12830

Source : Based on field data.

VIII. MODE OF TRANSPORT USED

The farmers/traders bringing the agricultural produce for sale in Kapsa market used four types of transport namely rickshaw trolleys, cycle, camel and basket. Since each farmer/trader brings small quantity, therefore, cycle has reported to be used by as high as 62 per cent of all farmers/traders bringing agricultural produce in the market. In case of farmers/traders of vegetables, more than 66 per cent of them used cycle as a means of transport. Rickshaw trolley is an another important means of transport used by around one-fourth of total farmers/traders. In case of fruits and foodgrains, the use of rickshaw trolley is even higher. The other two remaining means of transport, viz. camel and baskets are being used by a very few of the farmers/traders as evident from the Table-8.

Table-8: Traders Using Different Mode of Transport to Bring Agricultural Commodities

(No.)

Commodities	Camel	Rickshaw Trolleys	Cycle	Basket	Total
Vegetables	--	12 (20.00)	40 (66.67)	8 (13.33)	60 (100.00)
Foodgrains	4 (33.33)	4 (33.33)	4 (33.33)	--	12 (100.00)
Gur	--	2 (28.57)	5 (71.43)	--	7 (100.00)
Fruits	--	3 (50.00)	3 (50.00)	--	6 (100.00)
Total	4 (4.71)	21 (24.71)	52 (69.41)	8 (9.41)	85 (100.00)

Note : Figures given in brackets are percentage.

Source : Based on field data.

IX. DISTANCE COVERED TO REACH THE MARKET

As reported earlier that Kapsa rural market is important bi-weekly market of this area and its hinterland extends to around 22 villages. Large number of farmers/traders (47 per cent) come to this market by travelling a distance of around 8 kms. and more. Around 22 per cent of total farmers/traders travel a distance of 5-8 kms. Even more than half of the total vegetable farmers/traders a perishable product come from the distance of 8 kms. and more. The participation of the farmers/traders of the Kapsa and its very adjoining villages appears to be not much and more than 80 per cent farmers/traders of this market come here by travelling a distance of more than 3 kms. On an average, farmers/traders travel 8 kms. to reach this market to sell their produce. All these characteristics point to the fact that the Kapsa market is an important trading centre for the people residing in sizeable large area. Hence its improvement is going to benefit large number of villages. In Table-9, classification of sample farmers/traders has been made according to the commodities sold by them and distance covered.

Table-9 : Classification of Sample Farmers/Traders According to the Distance Covered to reach the Kapsa Market

Commodities	Distance Covered Area					(No.) Average Distance Covered
	0-1	1-3	3-5	5-8	8+	
Vegetables	2 (3.33)	8 (13.33)	7 (11.67)	10 (16.67)	33 (55.00)	8.83
Foodgrains	-	-	1 (8.33)	7 (58.33)	4 (33.33)	7.84
Gur	-	2 (28.57)	1 (14.29)	1 (14.29)	3 (42.86)	6.72
Fruits	-	1 (16.67)	1 (16.67)	2 (33.33)	2 (33.33)	7.00
Total	2 (2.22)	11 (12.22)	10 (11.11)	20 (22.22)	42 (46.67)	

Note : Figures in brackets indicate percentage.

Source : Based on field data.

X. EXISTING FACILITIES IN THE MARKET

As observed in the field, Kapsa market is held on the both sides of road as well as within the Kapsa village. There is no specific or separate place for the market. The vital market infrastructural facilities are lacking at present and only drinking water by a hand pump is available. There is no electricity, shed, toilet, cycle stand, proper drainage, etc.

XI. NEED OF IMPROVED FACILITIES

As explained above, the Kapsa rural market lacks marketing infrastructural facilities. Therefore, utmost need is to provide improved facilities because all the sample farmers and traders have expressed their desire to have such facilities as evident from Table-10. It becomes evident that farmers/traders selling different commodities in the market need improved facilities and all of them are willing to pay higher market fee for using the improved facilities.

Table-10 : Need of Improved Marketing Facilities in Kapsa Market

Commodities	Total No. of Farmers Shop	No. of Farmers Shops requiring improved facilities	No. of farmers willing to pay higher market fee	Total No. of Traders shop	No. of traders shop requiring improved facilities	No. of traders willing to pay higher market fee
Vegetables	36	36(100.00)	36(100.00)	24	24(100.00)	24(100.00)
Foodgrains	9	9(100.00)	9(100.00)	3	3(100.00)	3 (100.00)
Gur	--	--	--	7	7(100.00)	7(100.00)
Fruits	2	2(100.00)	2(100.00)	4	4(100.00)	4(100.00)
Sweets	--	--	--	2	2(100.00)	2(100.00)
Meat	--	--	--	2	2(100.00)	2(100.00)
Bangles	--	--	--	1	1(100.00)	1(100.00)
Total	47	47	47	43	43	43

Note : Figures in brackets indicate percentage.

Source : Based on field data.

XII. TYPE OF MARKETING FACILITIES REQUIRED

Since the infrastructural facilities are largely lacking in the Kapsa market, the farmers/ traders who bring different agricultural produce for sale in this market were asked by our research team that what type of facilities they need? The replies given by them have been presented in Table-11. It reflects from the table that the facilities namely, electricity, platforms for selling the produce, sheds, improvement in road condition and drinking water are reported to be required by the sizeable number of farmers/traders of this market. Besides these, open market place, toilet, cycle stand and proper drainage are needed by 20 to 33 per cent of farmers/traders. The need of storage facility was also felt by around 12 per cent of farmers/traders in the sample.

Table-11 : Type of Marketing Infrastructural Facilities Required by the Farmers/Traders of Kapsa Market

Commodities	Total No. of Farmers/ traders	Place	Drin-king Water	Shed	Road	Plat-form	Electri-city	Stor-age	Toilet	Perm-anent shop	Cycle stand	Proper drain-age
Vegetables	60	16 (26.67)	24 (40.00)	25 (41.67)	33 (55.00)	36 (60.00)	54 (90.00)	11 (18.33)	13 (21.67)	2 (3.33)	12 (20.00)	14 (23.33)
Foodgrains	12	2 (16.67)	6 (50.00)	7 (58.33)	9 (75.00)	6 (50.00)	4 (33.33)	-	5 (41.67)	-	4 (33.33)	3 (25.00)
Gur	07	3 (42.86)	4 (57.14)	6 (85.71)	1 (14.29)	3 (42.86)	6 (85.71)	-	2 (28.57)	-	2 (28.57)	4 (57.14)
Fruits	06	-	1 (16.67)	3 (50.00)	2 (33.33)	4 (66.67)	6 (100.0)	-	-	-	-	4 (66.67)
Sweets	02	1 (50.00)	1 (50.00)	1 (50.00)	1 (50.00)	-	2 (100.0)	-	-	-	-	2 (100.0)
Meat	02	1 (50.00)	-	2 (100.0)	1 (50.00)	-	1 (50.00)	-	-	-	-	2 (100.0)
Bangles	01	-	-	1 (100.0)	1 (100.0)	1 (100.0)	-	-	-	-	-	1 (100.0)
Total	90	23 (26.66)	36 (40.00)	45 (50.00)	48 (53.33)	50 (56.66)	73 (81.11)	11 (12.22)	20 (22.22)	2 (2.22)	18 (20.00)	30 (33.33)

Note : Figures in brackets indicate percentage.
Source : Based on field data

XIII. EXPECTED INCREASE IN ARRIVALS AFTER MARKET IMPROVEMENT

The above analysis has revealed the fact that (i) market infrastructural facilities are mostly absent in the market and (ii) farmers/traders of the market want improved facilities by paying higher market fee. We have tried to assess that how much increase in turn over of agricultural commodities would result on account of provision of improved infrastructural facilities. This analysis has been carried out in Table-12. It becomes evident that arrivals of vegetables are expected to grow by 61 per cent, foodgrains 94 per cent, gur 110 per cent and 167 per cent of fruits. In total, the arrivals of all agricultural commodities are expected to experience a growth of around 79 per cent per market day if improved market infrastructural facilities are made available therein. The increase in arrivals of all agricultural produce will result on account of increase in present arrival and increase in number of new shops of around forty (40).

Table-12: Expected Increase in Arrivals of Agricultural Produce After Market Improvement in the Kapsa Market

	Vegetables	Food-grains	Gur	Fruits	All Agricultural Produce
Number of Sample Shops	60	12	07	06	85
Total Qty. expected to be sold by sample shops per market day	4673.40	2419.64	278.83	535.09	7939.77
Average Qty. expected to be sold by sample shops per market day (kg.)	77.89	201.64	39.83	89.19	93.41
Total No. of Shops in the market	109	22	12	11	154
Total Qty. Expected to be sold per market day in existing shops (kg.)	8490	4436	478	981	14385
Expected increase in number of new Shops	16	8	7	9	40
Expected turnover of new entrants	1246.24	1613.12	278.81	802.62	3940.79
Total expected increase per market day turn over (kg.)	9736.24	6049.12	756.81	1783.62	18325.79
Actual Qty. sold per market day (kg.)	6063.67	3124.00	360.00	667.37	10215.04
Percentage Increase	60.56	93.63	110.22	167.26	79.40

Source : Based on field data.

XIV. EVALUATION OF ECONOMIC BENEFITS EMANATING FROM IMPROVEMENT IN THE INFRASTRUCTURE OF RURAL HAAT/PAINTHS

Apart from channelising fresh agriculture produce from farm level to final consumers there are other economic benefits which are likely to be generated in the process of market improvements. In fact these benefits should be considered as an important factor to take up the task of Rural Market Improvement Programmes. There are many economic benefits emanating from improved Rural Market infrastructure. These may broadly be grouped under following categories:

1. As an outcome of market improvements increased volume of agricultural produce resulting in comparatively lower or constant per unit marketing cost.
2. Improved efficiency of market operations in the form of better product display, better facilities and availability of more marketing hours for the buyers and sellers resulting in higher per unit price of agricultural produce.
3. Reduction in spoilage of perishable crops; vegetables and fruits with the availability of improved rural marketing infrastructure.
 - I. It is very logical to put up the idea before a farmer/trader having shop in the market that for availing better market infrastructure they should bear higher market fee. For that matter, the shop owners (traders as well as farmers) have convincingly

agreed to pay higher market fee for availing improved market facilities. Besides, additional market fee would also be realized from the new farmers/traders who would join the market after its improvement.

Table-13 presents the detailed picture of possible increase in market fee collection for different marketed produce owing to expected market improvements.

Table-13 : Actual Market Fee Paid and Increased Market Fee Required to be paid by Sample Traders/Farmers of Kapsa Market

Commodity	No. of Total Shops	Present Market Fee Collection from Total Shops (Per Market Day)	Expected Total No. of Shops After Market Improvements (Nos.)	Total Increased Market Fee Required for Market Improvements (Per Market Day)
Vegetables	109	111.18	125	820.80
Foodgrains	22	24.86	30	197.00
Fruits	12	12.86	19	124.75
Gur	11	12.00	20	131.33
Meat	04	4.00	5	32.83
Sweet	04	6.00	5	32.83
Bangles	02	2.00	5	19.70
Total	164	172.90	207	1359.24

Source : Based on field data.

As per Table-13, per market average fee collection from all shops comes to Rs.172.90, which will go upto Rs.1359.24 after market improvement. It is our estimate that 43 new shops will be joining the Kapsa market and thus, the total revenue generation per market day would reach Rs.1359.24 per market day. If we consider it on annual basis, the required increased total revenue, i.e. Rs.1359.24 can

be multiplied by 104 days of a year on which market will be held. It comes around Rs.141361. Thus, the required annual increased market fee after market improvement should be Rs.141361.00.

But in real terms, per unit cost of improved marketing facilities in case of all the produces sold in the market remains either same or marginally high except in case of meat where it has gone down after market improvements.

Table-14 : Change in Marketing Cost Before and After Market Improvement

Commodities	Present Market Turn Over of Sample Shops (Per Market Day) (Kg.)	Total Market Fee Collected Presently from Sample Shops (Per Market Day) (Rs.)	Expected Market Turn-over after market improvement in sample shops (Kg.)	Total Expected Collection as Market Fee from Sample Shops (Rs.)	Percentage Increase in Fee Collection after Market Improvement (Rs.)	% Increase in Per Unit Marketing Cost (Rs.)
Vegetables	3338	61.0(0.02)	4673.00	287.50(0.06)	371.31	200.00
Foodgrains	1704	13.50(0.01)	2420.00	70.00 (0.03)	418.52	200.00
Fruits	210	7.00 (0.03)	535.00	29.00 (0.05)	314.29	66.67
Gur	364	7.0 (0.02)	279.00	39.00 (0.88)	457.14	80.00
Meat	65	2.00 (0.30)	95.00	10.00(0.11)	400.00	(63.33)
Sweat	37	3.0 (0.10)	53.00	11.00 (0.21)	266.67	110.00
Total	5718	93.50(0.02)	8055	446.50(0.06)	377.54	200.00

* Figures in brackets show per unit marketing cost.

Source : Based on field data.

Table-14 shows increased market fee would result in an overall 377.54 per cent increase in market fee collection. As compared to this estimate has shown increase in per unit cost of marketing has remained only 200 per cent after market improvements. Increase in the per unit cost of marketing varied from 200 per cent in case of vegetables and foodgrains to 66.67 per cent in case of fruit products. There has been a decline of 63.33 per cent in per unit cost of marketing of meat products. In case of increases, the hike is not expected to remain same in coming years due to fast improvement in volume of trade in existing shops and entry of new traders/farmers in the market. Thus, provision of improved market facilities without significant increase in per unit marketing cost from the very beginning in the Kapsa Market is a significant economic benefit.

II. As a result of improved marketing facilities and infrastructure in the bi-weekly market of Kapsa farmers/traders are expected to maintain the quality of their produce to be sold in the market. In other words, they will be able to bring their produce in a market in a more presentable manner. Buyers will also feel more comfortable and confident while purchasing the produce under improved marketing conditions. Under these conditions sellers of produce may very easily justify at least 5 per cent increase in the prices of their produce. As there will be no real increase in per unit

marketing cost, this hike in price would be a net gain to the sellers of the agricultural produce.

Table-15 gives an example of net gain from 5 per cent hike in average prices of agricultural and other produces on account of improved market efficiency in the rural market of Kapsa. These estimates are based on quantity and prices of vegetables, foodgrains, fruits, gur, meat and sweets recorded from sample shop owners in the Kapsa market. However, the estimates are approximate because the factor of seasonality has been ignored. It is evident from these figures that under this process the highest gainer are of farmers/traders in foodgrains followed by farmers/traders dealing in vegetables, fruits, meat, gur and sweets marketing respectively in Kapsa market. Data presented in Table-15 shows that the traders/farmers involve in the trading manage to gain a sum of Rs.1134867.92 per annum with the introduction of market improvement in Kapsa market.

Table-15 : Estimation of Net Gain in Marketing Under Market Improvement

Commodities	Estimated Total Value of Commodities sold per market day at present (Rs.)	Estimated value of commodities to be sold per market day after market improvements (at current prices) (Rs.)	Estimated Value of Commodities to be sold after market improvements 5% high prices (Rs.)	Net gain per market day (Rs.)	Net gain per annum (Approx.) (Rs.)
Vegetables	41688	66936.65	70283.82	3346.83	348070.32
Foodgrains	44233	85595.05	89874.80	4279.75	445094.00
Fruits	13655	36492.87	38317.51	1824.64	189762.56
Gur	4320	9081.72	9535.81	454.09	47225.36
Meat	9800	14322.00	15038.10	716.10	74474.40
Sweat	4060	5815.54	6106.32	290.78	30241.12
Total	117756	218243.83	229156.02	10912.19	1134867.92

Source : Based on field data

Other indirect economic benefits are also involved in the process of efficient marketing system. A transparent and efficient system, as suggested for Kapsa market, will reduce the interference of middlemen and brokers in the determination of agriculture and other produce prices in the market. This will result in direct benefit to farmers/traders on account of increased prices. This gain may lead to expansion of agricultural activities resulting in higher production in the catchment area of Kapsa market.

III. Erection of marketing infrastructural facilities in Kapsa market may provide special benefit in the trading of perishable produce like vegetables, fruits and meat. In case of vegetables, fruits and meats, availability of facilities like water shed, light and storage may reduce at least 20 per cent spoilage of arrivals in the Kapsa market.

Data relating to proportion of vegetables in total market turn over come around 58 per cent in Kapsa market. It is expected to go higher with the availability of above listed infrastructural facilities. In case of fruits the spoilage rate is found to be over 40 per cent during the peak season in Kapsa market.

With the availability of water shed and storage the spoilage rate under such conditions may go down to less than 20 per cent. In case of meat and fish marketing, the availability of better infrastructural facilities will reduce the spoilage of these produce to a considerable extent. Apart from this the hygienic conditions will also be maintained with the availability of these facilities in the market. Under the ordinary conditions the spoilage of fruits and meat products is 25 to 35 per cent and it could be reduced to 15 to 10 per cent with the availability of required infrastructural facilities in Kapsa market of Phoolpur block.

XV. FINANCIAL AND ECONOMIC APPRAISAL OF INVESTMENT IN RURAL MARKET OF KAPSA

Introduction

Rural markets are a hub-centre of socio-economic activities in a region. Along with public services such as Primary Health Centre, Veterinary Hospital, Post Office, Bank, Educational Institutions, Play Ground, PCO, Police Station, etc., they provide a fillip to the tempo of social, cultural and economic growth of the region comprising of a number of villages from where buyers and sellers of goods and services are attracted to these markets.

Existing conditions in some such markets are far from satisfactory. A typical market may consist of some 200 stalls of a temporary nature and sellers sit on ground and on chabutras of houses and shops, open to sky without any shed or cover. Quite often they are held once or twice a week during the afternoon hours.

The products traded in such markets include consumer goods, horticultural produce such as vegetables, fruits, flowers, edible oil, spices, jaggery, festival goods and services, foodgrains, meat, fish, ready made wears, chappals, sweets, chhats, general goods and services of cobblers, smiths, barbers, etc. Arrival of commodities in the market fluctuates, depending upon the season and other factors.

Catchment area of such rural markets comprises of a large number of smaller and big villages in the vicinity of the village in which the market is held. Total catchment area of such markets may cover a distance of some 6-8 kms. comprising of 10-15 villages or even more.

The following are some of the important infrastructure and public utilities usually required in such markets:

- (1) Pucca open platforms
- (2) Shaded platforms
- (3) Pucca Shops
- (4) Space for Market Information Centre and Office for Market Management Committee
- (5) Room for Security Guard
- (6) Place for parking of cycles, scooters, buggies, horse-carts, tractor-trolleys, etc.
- (7) Storage facility
- (8) Electrification
- (9) Drainage facility
- (10) Boundary wall and Fencing around the haat area with the gates
- (11) Construction of Roads
- (12) Cattle Shed with drinking water facilities
- (13) Drinking wader
- (14) Toilets
- (15) Place for waste disposal
- (16) Plantation of trees

Management of the Market

Quite often the rural market is managed by the Gram Panchayat which realizes 'Tehbazari' from the traders. Another alternative arrangement is that the contract is awarded to a contractor for a stipulated amount per period and the contractor collects Tehbazari from the shopkeepers at predetermined rates. Gram Panchayat may form a "Market Management Committee" (MMC) to monitor the various activities of the market. The committee may take decisions on the mode of maintenance, management, rate of Tehbazari, method of its realization and settlement of disputes related to the market.

Construction of a market with covered and open pucca platforms, fencing around the area and facilities for storage, toilets, water supply, proper drainage and parking, etc. can bring about an improvement in the conditions in such rural markets. Shopkeepers are willing to pay the 'Tehbazari' at higher rates provided proper facilities are developed.

Financial Analysis of Investment in Infrastructure

Initial investment is required on land and on capital cost involved in the creation of infrastructural facilities described above. Land for rural market could be the land owned by the Gram Panchayat, so that no substantial investment is required to be made on this count.

Upkeep of the infrastructure is a must for the sustainability and trouble-free services. Below we provide estimates of expenditure (both capital and revenue type) required to be made in Kapsa market located in Phoolpur Block of Allahabad District, for which this feasibility study is being carried out (For details of the mathematical approach involved in this, see the Appendix given at the end).

XVI. FINANCIAL ANALYSIS OF PROPOSED INVESTMENT IN KAPSA MARKET

Here we evaluate financial viability for providing facilities for the improvement of infrastructural facilities and other amenities in the rural market of Kapsa. Parameters involved in the financial analysis are detailed below:

1. Initial Capital Investment

Since the Kapsa market, at present, lacks infrastructural facilities therefore substantial amount will have to be spent on the modernisation of the market. Platform/sheds need to be constructed, water supply is to be arranged and other infrastructural facilities are to be provided. All this would require capital expenditure. According to our estimate, Rs.10,00,000/- would be needed as initial capital, which will have to be spent over a time span of one year. This may be

termed as initial capital investment. We also assume that the entire capital investment will be made instantaneously at the beginning of the year. This is not an unrealistic assumption. For the sake of simplicity, initial capital cost may be treated to be Rs.10,00,000.

2. Life Span of the Project

The market infrastructural facilities proposed to be provided in the Kapsa market would have usefulness for a fairly long period of time though depreciation is bound to take place with the passage of time. The actual life span of the project cannot be estimated with high degree of accuracy but on the basis of technical opinion of the Architect/Civil Engineer, it is assumed that the facilities proposed to be provided would last for a period of at least 15 years. It may not be unrealistic to assume that the facilities provided would remain useful even for a period of 20 years and above. In case of Kapsa market we have taken the life span of the project to be 15 years. Thus, scrap value of the initial infrastructural facilities created at a cost of Rs.10 lakh has been treated as 30% of the initial capital cost, i.e. Rs.3 lakh.

3. Cost of the Capital

Cost of the capital for project is a critical factor which determines the viability of project. Cost of capital based on the competitive interest rates

prevailing in the market would be too high if considered for this market. For socially desirable activities, it is even worthwhile to examine the financial viability at a relatively lower cost of capital. In practice also, the agencies involved in financing socially desirable activities encourage development of infrastructural facilities at a lower rate of capital cost. The projects so financed have plethora of social benefits, apart from financial benefits emanating from the project financed.

Keeping all this in view, 6 per cent annual cost of capital has been considered in the financial analysis of the Kapsa Market.

4. Cost of Repair and Maintenance

The proposed facilities to be provided in the market are bound to depreciate over the passage of time. Proper maintenance and upkeep of facilities in good condition is a social as well as economic necessity.

Keeping this objective in view, adequate provision has been made to account for the cost likely to arise on account of repair and maintenance. Items of expenditure under this head are as follows:

- (a) Expenditure on labour, materials and overheads for repair and maintenance of facilities;

- (b) Repair/Replacement of water pumps, electrical equipments and accessories etc. from time to time;
- (c) Salaries and wages payable to persons employed for the upkeep of facilities created by the project.

Details of annual maintenance expenditure are as follows:

1.	Watchman for Security @ Rs.1500 per month	Rs.18,000
2.	Sweeper for cleaning for 104 days @ Rs.40 per day	Rs. 4,160
3.	Electrical Maintenance for 104 days @ Rs.100 per day	Rs.10,400
4.	Maintenance of Handpump	Rs. 1,000
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	Total	Rs.33,560
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The above expenditure is expected to increase @ 5% annually.

Technical estimates suggest that there would be zero expenditure on repair and maintenance of the project during the first year. It is assumed that during second and third years, 2 per cent of the initial investment would be required for repair and maintenance. During the years 4 to 7, this will be 3% of the initial investment and thereafter @ 5 per cent of the initial capital investment will be

needed for repair and maintenance of civil work and other infrastructural facilities till 15th year.

5. Revenues Arising from the Market

The completion of the market improvement programme would result into substantial improvement in the working conditions of the Kapsa market. Farmers and traders would get a sizeable and respectable place to sit in and transact the business. They would be saved from the inconvenience arising due to limited space, open sale and bad weather. There is always a good-will value associated with a good looking shop.

As a result of improved facilities in the market it is expected that on account of availability of improved facilities the users of market would be willing to pay an increased market fee and rent for using these facilities.

Views of farmers/traders were solicited on the possible increase in the market fee recoverable from them after market improvement programme is carried out. Incremental increase in revenue due to creation of infrastructural facilities has been put at Rs.1 lakh in the initial year. This is expected to go up @ 10% per annum.

NPV (Net Present Value) of Investments in the Projects

Based on the assumptions stated above, the sources of cash inflows and outflows are as follows:

Inflows

- (a) Expected increase in revenue (Beginning at Rs.1,41,361 per annum and going up @ 10% per annum)
- (b) Terminal value of initial investment (after 15 years from now) (30% of initial capital cost)

Outflows

- (c) Initial capital cost (Rs.10 lakh)
- (d) Cost of Repair and Maintenance (Rs.33560 in the initial year and expected to increase @ 5% per annum)
- (e) Cost of maintenance of civil work and other infrastructural facilities (2% of capital cost in years 2 and 3, 3% in years 4 to 7, and 5% from years 8 onwards).

**Table 16: Computation of NPV and IRR on the basis of Expected Cash Flows
(Financial Point of View)**

Year	Addl Revenue Generated (based on increase @ 10% p.a.)	Terminal Value	Initial Capital Cost	Cost of Repair & Maintenance (based on increase @ 5% p.a.)	Rate of Increase in the Maintenance cost of civil work	Cost of Maintenance of Civil Work (based @ 2% of initial investment in years 2&3 and 5% thereafter)	Net Cash Flow
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
0			1000000				(1000000)
1							0
2	141361			33560	0.02	20000	87821
3	155519			35238	0.02	20000	100281
4	171071			37000	0.03	30000	104071
5	188178			38850	0.03	30000	119328
6	206996			40792	0.03	30000	136203
7	227695			42832	0.03	30000	154863
8	250465			44974	0.05	50000	155491
9	275511			47222	0.05	50000	178289
10	303062			49583	0.05	50000	203479
11	333369			52063	0.05	50000	231306
12	366706			54666	0.05	50000	262040
13	403376			57399	0.05	50000	295977
14	443714			60269	0.05	50000	333445
15	488085	300000		63282	0.05	50000	674803
NPV = 0; IRR = 12% per annum							

Based on a cost of capita of 12%, the NPV of the project is zero.

However, with changes in the cost of capital the NPV of the project is as follows:

Table 17: Impact of Changes in Cost of Capital on Net Present Value

Cost of Capital	NPV (in Rs.)
0.06	669575
0.08	394589
0.10	175698
0.12	(0)
0.14	(142161)
0.15	(203063)
0.16	(258159)

Additional revenue arising due to the proposed investment on infrastructural facilities is expected to be Rs.1,50,000 per annum in the initial year. However, if this falls short of the expectations, NPV becomes negative. In the tables below, the NPV and IRR are given for different amounts of additional revenue generated in the initial year ranging from Rs.150000 to as high as Rs.180000 along with the rates of growth in the revenues ranging from 5% per annum to 20% per annum.

Table 18 : Table Giving NPV at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)					
	150000	155000	160000	170000	175000	180000
0.05	(269085)	(231147)	(193209)	(117333)	(79396)	(41458)
0.06	(207727)	(167744)	(127761)	(47794)	(7811)	32172
0.08	(71312)	(26782)	17748	106809	151339	195870
0.10	85790	135557	185324	284858	334625	384392
0.12	266884	322688	378491	490098	545902	601705
0.14	475786	538553	601320	726854	789621	852388
0.15	592016	658657	725229	858581	925223	991864
0.20	1316803	1407604	1498405	1680006	1770807	1861608

Table 19 : Table Giving IRR at Various Levels of Revenues of the Initial Year and Various Rates of Growth

Rate of Growth in Revenues	Revenue of the Initial Year (in Rs.)					
	150000	155000	160000	170000	175000	180000
0.05	0.078	0.085	0.091	0.103	0.108	0.114
0.06	0.089	0.095	0.101	0.113	0.119	0.124
0.08	0.110	0.116	0.122	0.134	0.139	0.145
0.10	0.131	0.137	0.142	0.154	0.159	0.165
0.12	0.150	0.156	0.162	0.173	0.179	0.184
0.14	0.169	0.175	0.181	0.192	0.197	0.203
0.15	0.179	0.185	0.190	0.201	0.207	0.212
0.20	0.224	0.230	0.236	0.247	0.252	0.257

Accumulations in the Sinking Fund

Surpluses of revenues over expenditure can be used for further expansion of facilities in the market and for providing additional facilities to sellers and buyers. These funds can be invested in safe and profitable investment avenues with a view to get a lump sum amount of money which can be used for replacement of infrastructural facilities when they get decayed and outdated. The deposits in the fund are expected to be as follows, depending upon the rate of interest earned on investments:

Table 20: Table giving accumulated value of Deposits made in the Sinking Fund at Different Rates of Interest, as at the end of 15 years

Rate of Interest	Revenue of the Initial Year (Rs. in Lakh)					
	1.50	1.55	1.60	1.65	1.70	1.75
0.08	47.95	50.10	52.25	54.40	56.55	58.70
0.09	50.52	52.80	55.07	57.35	59.63	61.91
0.10	53.28	55.69	58.11	60.53	62.94	65.36
0.11	56.24	58.81	61.37	63.94	66.50	69.07
0.12	59.43	62.16	64.88	67.60	70.33	73.05
0.13	62.86	65.75	68.65	71.54	74.44	77.33
0.14	66.54	69.62	72.70	75.78	78.88	81.94
0.15	70.50	73.78	77.05	80.33	83.61	86.89

ECONOMIC ANALYSIS

The following intangible benefits of the investment are particularly noteworthy:

- (1) Increase in the value of transactions carried out in the market
- (2) Benefits for women
- (3) Technology dissemination and technology development
- (4) Reduction in spoilage
- (5) Dissemination of market intelligence
- (6) Encouragement in the trade of agricultural and horticultural produce

As is quite obvious, if we take into consideration the impact of the above mentioned intangible factors on the NPV or IRR of the project, then investment on

infrastructure in a rural market becomes a highly profitable proposition. Detailed calculations incorporating various aspects of social cost benefit analysis have not been carried out.

We have considered in this study the financial dimensions of the project and have gathered information relating to financial viability. Ultimate success of the project would depend on how imaginatively the project is managed in all its aspects. In this regard, sound financial management is of great importance.

There are considerable moral and cultural benefits accruing from the investment. Such investment cannot be looked as an instrument merely for solving the problems of poverty and backwardness. The real contribution of the investment is in terms of enhancing the quality of life of the people in the region. The project would be advantageous from different view points.

Some such non-tangible benefits accruing from investment in the project are detailed below:

- 1) Markets are held under unhygienic conditions as at present. Food articles, vegetables are kept under exposed conditions and become carriers of diseases and ailments. The project would create healthy and hygienic conditions and thereby the physical well being of the people would be improved.
- (2) Market is a place of social interaction. It is a venue where people belonging to the region converge for a day or two in a week and buy articles of daily consumption. Improved condition in the market enables people to buy good quality products and thus the quality of life would be improved.

- (3) Political and social reform activities are conducted through these markets. Improved conditions in the market would attract more and more people to come to the market and derive benefits.
- (4) Improved conditions in the market could lead to increased business activities and increased arrival of articles of consumption. More business transactions would be carried out through the market and consequently more employment as well as income generation opportunities would be opened up.
- (5) Consciousness about new products and technology, etc. would be spread through the market. This would lead to improvement in the living standards of people. Companies can launch new products and processes suited for local consumption through these markets.
- (6) Climatic conditions reach extreme level during summer, winter and rainy seasons. Conditions become extremely bad particularly during the rainy season and the arrivals of articles is adversely affected. During summer also, when temperature level reaches high, it becomes very difficult both for the traders as well as the customers to visit the market. During winter season also, chilly winds prevent customers and traders to visit the market. Improved conditions would increase the number of days during which the markets are held.
- (7) When markets are not held regularly or when customers do not arrive in adequate numbers, agricultural produce particularly the perishable vegetables get spoiled or they have to be sold at low price resulting into loss for the producers as

well as consumers. Poor and vulnerable sections of the society are particularly harmed on account of poor conditions in the market.

- (8) Improvement in the market would lead to increased economic activity in the region. It would lead to more efficient and effective utilization of the natural as well as man-power resources available in the region.
- (9) Cultural activities would be encouraged through improved working conditions. Social welfare and reform activities can also be carried out more easily by improving the conditions in the market.

In a nutshell, the conditions in the market indicate the level of development of civilization. The investment under consideration is a contribution towards civilizational development and thus carries within it several non-financial and non-economic benefits.

If these are taken into consideration, the true value of NPV and IRR is much higher than has been computed in the study. This is shown in the table below. Here we have added an amount equal to 10% of the incremental trading caused due to generation of infrastructural facilities in the market. Savings caused due to reduction in spoilage @ 2% of the additional trading have also been added.

Table 21 : Computation of NPV and IRR on the basis of Economic Analysis

Cash Flow on the basis of Financial Analysis	Benefits of Increase in Trading to be charged in each market	Benefit due to Reduction in Spoilage to be charged in each market	Total Cash Flow
100281	119161	23832	234274
104071	125119	25024	254214
119328	131375	26275	276978
136203	137944	27589	301736
154863	144841	28968	328673
155491	152083	30417	337991
178289	159687	31937	369914
203479	167672	33534	404685
231306	176055	35211	442572
262040	184858	36972	483869
295977	194101	38820	528698
333445	203806	40761	578012
674803	213996	42799	931598
NPV = 1033309; IRR = 23.384%			

WORDS OF CAUTION

Financial viability of the project depends primarily on :

- (1) Surplus of Revenue over expenses (Net Cash Flow); and
- (2) The cost of capital.

In the table below, we have calculated the requirements of net cash flow based on different life spans of the project ranging between 15 to 40 years and on the basis of cost of capital ranging between 5% to 18% per annum for an initial investment of Rs.10 lakh on the infrastructural facilities in the market. The results are quite revealing in the same

that if the market fails to generate a minimum revenue as given in the table, the investment would not be financially viable proposition.

Table 22 : Table Giving Equivalent Annual Cost for Different Life Span of the Project at Different Costs of Capital

Cost of Capital (k)	Life of Project (n) (in Years)					
	15	20	25	30	35	40
0.05	96342	80243	70952	65051	61072	58278
0.06	102963	87185	78227	72649	68974	66462
0.08	116830	101852	93679	88827	85803	83860
0.10	131474	117460	110168	106079	103690	102259
0.12	146824	133879	127500	124144	122317	121304
0.15	171017	159761	154699	152300	151135	150562
0.16	179358	168667	164013	161886	160892	160424
0.18	196403	186820	182919	181264	180550	180240

APPENDIXMATHEMATICAL APPROACH INVOLVED IN THE APPRAISAL OF
INVESTMENT ON INFRASTRUCTURE IN A RURAL MARKET

Let the initial investment on the development of infrastructural and public utilities in a market be Rs. 1. It takes about one year to complete the construction of the facilities and these are available for use after a period of one year since construction commences. It is assumed that incremental expenditure on maintenance of the facilities is incurred all at the end of every year and commences from the end of 2 years since construction starts. This same logic holds for incremental revenues also. The gap between incremental revenues and incremental expenditures (i.e. surplus of revenues over expenditures) is assumed to be Rs.X in the beginning (i.e. at the end of 2 years since construction etc. starts) and this increases in real term, @ g per annum. Useful life span of the initial investment is taken to be 14 years with an assumed depreciation @ 5% per annum simple, so that the terminal value of the infrastructural facilities created in the first year would remain to be 30% of the initial Investment 1. Cost of capital is assumed to be 'k' per annum.

Based on the above logic,

$$I = \frac{X \frac{1+g}{1+k}^{14} - 1 (1+k)^{15}}{(1+k)(g-k) [(1+k)^{15} - 0.30]} X, \text{ and}$$

$$X = \frac{[(1+k)^{15} - 0.30] (1+k)(g-k)}{[(1+k)^{15} \left(\frac{(1+g)^{14}}{(1+k)^{14}} - 1 \right)]} I$$

If k and g are assumed to be 12% and 10% respectively, the above expression becomes

$$I = 10.53 \cdot X \cdot (Bx), \text{ or equivalently}$$

$$X = 0.095 \cdot I \quad (\text{C.I.})$$

If cost of capital (k) ranges between 6% to 15% and the growth in surplus (g) ranges between 5% to 20%, the following matrix giving the values of the coefficients involved in the above expression $X = .095 \cdot I$ is generated.

Table 23: Table giving the values of 'C' in the expression $X = C \cdot I$. at different rates of cost of capital and rates of growth

$g = \text{rate of growth in surplus of revenues over expenditures}$	$k = \text{Cost of capital}$						
	0.0600	0.0800	0.1000	0.1200	0.1400	0.1500	
0.0500	0.0746	0.0900	0.1067	0.1246	0.1437	0.1538	
0.0600	NA	0.0849	0.1009	0.1182	0.1367	0.1465	
0.0800	0.0620	NA	0.0901	0.1061	0.1234	0.1326	
0.1000	0.0546	0.0668	NA	0.0950	0.1110	0.1195	
0.1200	0.0479	0.0589	0.0712	NA	0.0995	0.1074	
0.1400	0.0419	0.0518	0.0629	0.0753	NA	0.0962	
0.1500	0.0392	0.0486	0.0591	0.0709	0.0840	NA	
0.2000	0.0277	0.0348	0.0429	0.0520	0.0624	0.0680	

($X = \text{Surplus of revenue over expenditure required to be generated at the end of year 2}$, $I = \text{Initial capital outlay}$, $C = \text{Coefficient values computed on the basis of the assumptions stated in the model}$)

The above table acts as a ready reckoner to ascertain the amount of surplus of revenues over expenditures required to be generated on annual basis with a constant annual growth rate of 'g' and a given cost of capital 'k' in order to justify (on the grounds of financial viability) the initial investment of Rs.1 in a market. As an example, if initial capital outlay on a market is Rs.10 lakhs, then .095 X Rs.1000000= Rs.95000 is the annual surplus of revenues over expenditures which is required to be generated at the end of the initial year (i.e. year 2) in which facilities are made available for use. This should grow annually @ 10% per annum ($g=.10$) in order to make the project viable from financial point of view.

Reciprocals of the values given in the table 21 above, gives the values of B in the expression $I = BX$. Results are as follows:

Table 24: Table giving the values of 'B' in the expression $I = BX$ at different rates of cost of capital and rates of growth

$g = \text{rate of growth in surplus of revenues over expenditure}$	$k = \text{Cost of capital}$						
	0.06	0.08	0.10	0.12	0.14	0.15	
0.05	13.40	11.11	9.38	8.03	6.96	6.50	
0.06	NA	11.77	9.91	8.46	7.31	6.83	
0.08	16.13	NA	11.09	9.42	8.10	7.54	
0.10	18.32	14.98	NA	10.53	9.01	8.37	
0.12	20.88	16.97	14.05	NA	10.05	9.31	
0.14	23.85	19.29	15.89	13.28	NA	10.39	
0.15	25.52	20.58	16.91	14.10	11.91	NA	
0.20	36.04	28.73	23.32	19.21	16.03	14.71	

The above table acts as a ready reckoner to ascertain the maximum amount of capital investment, which should be made on the expectation of a given amount of surpluses of revenues over expenditures. As an example, if it is expected that a surplus of Rs.95000 can be generated in the initial year, then the investment will remain financially viable upto a maximum investment of $Rs.10.53 \times 95000 = Rs.10$ lakhs. An initial investment of an amount less than Rs.10 lakhs, which can generate a surplus of at least Rs.95000 in the initial year, is of course, a good investment proposition. The above result is true for a cost of capital 12% and the annual growth of surplus of revenues over expenditure @ 10% per annum. Other values given in the table are interpreted similarly.